9-1450-646-10/991

TM 9-1450-646-10

TECHNICAL MANUAL
OPERATOR'S MANUAL

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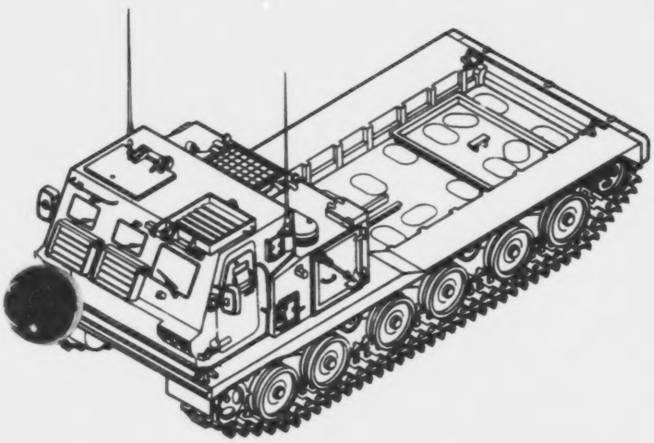

CARRIER, MULTIPLE LAUNCH ROCKET SYSTEM, M993
(2350-01-091-5405)

HEADQUARTERS,
DEPARTMENT OF THE ARMY

This copy is a reprint which includes current pages from Changes 1 through 3.

AUGUST 1984

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CHANGE
No. 3

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., *11 March 1988*

TECHNICAL MANUAL
OPERATOR'S MANUAL
CARRIER
MULTIPLE LAUNCH ROCKET SYSTEM, M993
(2350-01-091-5405)

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2-1 and 2-2	2-1 and 2-2
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TM 9-1450-646-10
C2

Technical Manual
No. 9-1450-646-10
Change No. 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., *8 April 1987*

TECHNICAL MANUAL
OPERATOR'S MANUAL
CARRIER, MULTIPLE LAUNCH ROCKET SYSTEM, M993
(2350-01-091-5405)

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2-69 and 2-70	2-69 and 2-70
2-91 and 2-92	2-91 and 2-92
2-123 and 2-124	2-123 and 2-124
2-127 thru 2-135(2-136 blank)	2-127 thru 2-135(2-136 blank)
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2-251 thru 2-253(2-254 blank)	2-251 thru 2-253(2-254 blank)
Index 5 and Index 6	Index 5 and Index 6
Index 11(Index 12 blank)	Index 11(Index 12 blank)

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By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

R.L. DILWORTH
Brigadier General, United States Army
The Adjutant General

Distribution:

To be distributed in accordance with DA Form 12-32, Operator Maintenance requirements for Multiple Launch Rocket System.

TM 9-1450-646-10
C1

**CHANGE
NO.1**

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., *1 April 1986*

TECHNICAL MANUAL
OPERATOR'S MANUAL
CARRIER, MULTIPLE LAUNCH ROCKET SYSTEM, M993
(2350-01-091-5405)

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C-3 and C-4	C-3 and C-4
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E-13 and E-14	E-13 and E-14
Index 1 thru 11 (Index 12 blank)	Index 1 thru 11 (Index 12 blank)

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Brigadier General, United States Army
The Adjutant General

Distribution:

Distribute IAW DA Form 12-32R for Operator's Maintenance required for the Carrier, Multiple Launch Rocket System (M993).

SUMMARY OF WARNINGS AND FIRST AID

This list summarizes critical WARNINGs in this manual. They are repeated here to let you know how important they are. Study these WARNINGs carefully; they can save your life and the lives of soldiers with whom you work.

WARNING

HEATER AND ENGINE EXHAUST FUMES CONTAIN DEADLY POISONOUS GASES.

SEVERE EXPOSURE CAN CAUSE DEATH OR PERMANENT BRAIN DAMAGE.

EXHAUST GASES ARE MOST DANGEROUS IN PLACES WITH POOR AIR FLOW.

THE BEST DEFENSE AGAINST EXHAUST GAS POISONING IS VERY GOOD AIR FLOW.

To protect yourself and your partners, always obey the following rules:

Do not run heater or engine indoors unless you have VERY GOOD AIR FLOW.

Do not idle engine for a long time unless there is VERY GOOD AIR FLOW.

Do not drive carrier with any inspection doors or access panels open.

Do not use NBC masks for protection against engine exhaust fumes. NBC precleaner filter unit will not protect you against engine exhaust.

BE ALERT at all times. Check for the smell of exhaust fumes. If you notice any fumes, open COMMANDER'S HATCH COVER AND OBSERVATION WINDOWS. TURN ON VENT FANS.

REMEMBER: The best defense against exhaust gas poisoning is VERY GOOD AIR FLOW.

Exhaust gas poisoning causes dizziness, headache, loss of muscle control, sleepiness, coma, and death. If anyone shows signs of exhaust gas poisoning, get ALL SOLDIERS out of the carrier. Make sure they have lots of fresh air. KEEP THEM WARM, CALM, AND INACTIVE. GET MEDICAL HELP. If anyone stops breathing, give artificial respiration. See FM 21-11 for first aid.

WARNING

Noise from carrier or weapons can damage hearing of soldiers in carrier. All personnel in carrier MUST WEAR DOUBLE HEARING PROTECTION when missiles are launched or carrier is operated. Hearing protection devices must be properly worn to provide effective protection.

If DOUBLE HEARING PROTECTION is not worn, the safe level of noise exposure will be exceeded in a short time. Hearing loss occurs gradually. Each noise exposure that exceeds the ear protection guidelines below will cause a temporary hearing loss. Over time, the loss in hearing will become permanent. Plan each day's operation, and be sure all crew and riders have the required ear protectors. Spare earplugs must be available.

DEFINITIONS:

DH-132 — The "tankers helmet," also called "CVC" helmet. Must be in good condition, with liner and earcups fitted tightly, and chin strap worn at all times.

EARPLUGS — Only standard issue earplugs are acceptable. All of the dismounted squad soldiers must be trained in how to use them. Since they may be removed and lost, spares must be carried.

DOUBLE HEARING PROTECTION — Use of two hearing protection devices at the same time. For this vehicle, use earplugs with the DH-132 helmet.

EAR PROTECTION GUIDELINES

1. DH-132 helmet must be worn at all times.

2. DH-132 helmet, plus earplugs, must be worn for operations exceeding 14 miles (23 km) in 24 hours.

3. Doors, observation windows, louvers, and hatch cover must be closed before firing missiles.

USE OF RADIO WITH EARPLUGS

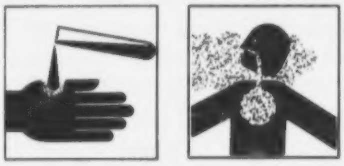
Wearing earplugs in addition to your DH-132 helmet or headset can actually improve your ability to hear the radio in a high level noise area. DO NOT remove the earplugs to use the radio.

WARNING

Cleaning solvent is poisonous and can burn. Continued exposure to solvent can cause skin problems.

Always use in area with good air flow, away from heat or flames.
Do not breathe solvent fumes.
Do not put hands in solvent.
Apply solvent with brush.
If solvent gets on hands, wash them.
If solvent gets in eyes, flush with fresh water and get medical help.
Keep fire extinguisher nearby.

WARNING



NBC agents can kill you. Do not service air cleaner or vent system after NBC attack until carrier has been decontaminated by NBC team.

WARNING

You could be killed or injured by rocket blast or flying objects. Close carrier doors, observation windows, louvers and hatch cover before launching rockets.

WARNING

Fuel can catch fire and burn you. Do not smoke. Wipe up spilled fuel.

WARNING

Starting engine right after a fire could restart fire. Do not move MASTER POWER and/or LAUNCHER INTERCONNECT switches to ON until cause of fire has been repaired or removed.

WARNING

Sparks from static electricity could cause a fire or explosion. Make sure nozzle touches metal in filler neck when fueling carrier.

WARNING

Fire can restart due to equipment malfunction or damage. Soldiers can be killed or injured. If fire extinguishers are empty and there is a possibility of fire occurring again, offload both launcher pod containers.

WARNING

Running engine fan will blow away halon before fire is out. Soldiers can get burned or injured. Equipment can get damaged. Stop engine before you discharge halon.

WARNING

Exposure to halon could make you dizzy. Halon can irritate your eyes and throat. After halon discharge, open commander's hatch cover and observation windows. Turn on vent fans. Get soldiers out of carrier within 5 minutes.

WARNING

Discharging fire extinguisher gas can freeze your skin. Keep away from discharging gas.

WARNING

Carrier movement can throw you from your seat and injure you. Wearing seat belt is mandatory.

WARNING

Personnel can be run over when you drive in reverse. Always post ground guides before you backup.

WARNING

PIVOT STEER causes the carrier to come to a fast stop. Soldiers can be injured. Do not use PIVOT STEER to stop carrier.

WARNING

Carrier can jump forward and hit towing vehicle when you shift from TOW START to DRIVE. Soldiers can be injured. Do not accelerate when you shift to DRIVE.

WARNING

Braking can jackknife carrier when you tow with tow cables or tow bar. Jackknife could injure soldiers and damage carriers. Do not tow at speeds over 15 mph (25 km/h) with tow bar. Do not tow at speeds over 5 mph (8 km/h) when in rough terrain, towing backward, or towing with tow cables.

WARNING

Soldiers can be drowned or injured. Carrier could sink, swamp, or be flooded:

Do not enter water that is more than 40" (1 m) deep at any point.
Do not enter water faster than 5 mph.
Do not go into water with choppy waves.
Do not try a direct crossing in swift currents.

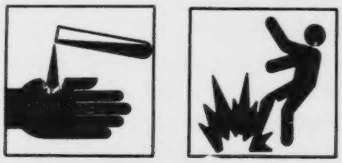
WARNING

Hot parts can burn you. Parts can heat up when you run engine and/or drive carrier. DO NOT TOUCH following parts after engine is run or carrier is driven:

Oil lines
Coolant lines
Exhaust pipes
Oil filters
Transmission
Radiator
Heater vents
Shock absorbers

Allow time for hot parts to cool before you start work.

WARNING



Gas from batteries can explode and injure you. Do not have open flames, make sparks, or smoke near batteries. Battery acid can burn or blind you. Do not get acid on your skin or eyes.

WARNING

Battery posts and cables touched by metal objects can short circuit and burn you or injure you. Use caution when you work with tools or other metal objects. Do not wear jewelry when you work on electrical system.

WARNING

Radio frequency energy from antennas can shock or burn you. Do not touch radio antenna if radio is in use. Check with soldiers inside carrier to make sure radio is not in use.

WARNING

Cab can fall when not in fully raised position. You could be crushed. When raising cab, make sure cab is in full up position. Do not allow personnel under cab that is partially raised.

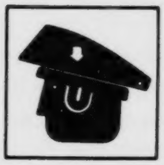
WARNING

Doors can swing open and injure you when you raise cab. Secure doors in open position before you raise cab. Stay clear of doors when cab is being raised.

WARNING

Louvers can swing down and kill or injure you when you raise cab. Make sure locking pin secures louvers in stowed positions before you raise cab. Stay clear of louvers when cab is being raised.

WARNING



Hatch cover could fall and injure you. Keep hands clear when you open or close cover. Make sure hatch is latched and secure when in the OPEN, POP-UP or CLOSED positions.

WARNING

Hydraulic fluid is poisonous and can be absorbed through your skin. Never service hydraulic system when fluid is hot or under pressure. Avoid skin contact. Wash hands with soap immediately after servicing, and wash off any fluid which comes in contact with skin. If fluid gets into eyes, wash eyes immediately and get medical help.

For artificial respiration and first aid, see FM 21-11.

echnical Manual
No. 9-1450-646-10

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, *3 August 1984*

OPERATOR'S MANUAL
CARRIER, MULTIPLE LAUNCH ROCKET SYSTEM
(2350-01-091-5405)

Reporting Errors and Recommending Improvement

You can help improve this manual. If you find any mistakes, or if you know a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual, directly to: Commander, U.S. Army Tank-Automotive Command, ATTN: DRSTA-MB, Warren, Michigan 48090. A reply will be sent to you.

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ALPHABETICAL INDEX .... Index 1

DA FORM 2028-2

METRIC CONVERSION CHART

HOW TO USE THIS MANUAL

This manual tells you how to use the Multiple Launch Rocket System (MLRS) Carrier.

Before starting a task or procedure, read HOW TO USE THIS MANUAL and CHAPTER 2, Section I, DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS.

WHAT'S IN THE MANUAL — FRONT TO BACK

SUMMARY OF WARNINGS AND FIRST AID lists the warnings and first aid information in this manual. The warnings cover hazards that could kill or injure personnel. Shorter versions of these warnings may appear in the task procedures.

TABLE OF CONTENTS tells you where each chapter, section, and appendix starts. Information you need most often is listed on the front cover index.

CHAPTER 1 covers general information. It also gives a brief description of major parts and features of the carrier.

CHAPTER 2 covers descriptions and functions of all controls and indicators. It also includes Preventive Maintenance Checks and Services (PMCS) and operation procedures.

CHAPTER 3 covers lubrication instructions, troubleshooting and maintenance procedures authorized for crew performance.

CHAPTER 4 lists manuals which tell you how to operate auxiliary equipment on the vehicles.

APPENDIX A lists references to be used by personnel in operating and maintaining the carrier. These references include technical manuals and other publications.

APPENDIX B lists components of end item and basic issue items. Components of end item are those items which are assembled and become a permanent part of the carrier. Basic issue items are items needed to put the carrier in operation, operate it and do emergency repairs.

HOW TO USE THIS MANUAL (cont)

APPENDIX C lists additional items required to support the carrier during operation.

APPENDIX D lists expendable supplies and materials.

APPENDIX E is a stowage guide for all removable equipment carried in and on the carrier. This appendix includes a guide to the identification (ID) plates on the carrier.

ALPHABETICAL INDEX lists the page number where major controls, procedures, indicators, systems, and subsystems are found in this manual.

DA FORM 2028-2 is used to report errors and to recommend improvements for procedures in this manual. Three blank DA Forms 2028-2 are in the back of this manual. A sample is provided to show you how to fill out the DA Form 2028-2.

METRIC CONVERSION CHART converts US customary measurements to their metric equivalents. Measurements in this manual are given in both US customary and metric units.

Which type of procedure do you use?

There are four different types of procedures or tasks in this manual. They are: operation tasks, maintenance tasks, Preventive Maintenance Checks and Services (PMCS) tasks, and troubleshooting tasks. Decide which of the four types of tasks you need to use.

How do you find the correct task or procedure?

Pick a key word from the carrier part or system to be used during the task. Look in the ALPHABETICAL INDEX for this key word or the name of the action you will perform. Turn to the page indicated.

The ALPHABETICAL INDEX lists each task under one or more headings. The task, TOW START DISABLED CARRIER, could be found:

Under "T"

Tow start disabled carrier .... page 2-237

Under "C"

Carrier:
  Tow start disabled .... page 2-237

How do you read the tasks?

Pay attention to all warnings, cautions, and notes. These can appear in all four types of tasks. These help you avoid harm to yourself, other personnel, and equipment. They also tell you things you should know about the task. Before you start, get all the tools, supplies, and personnel you need to do the task.

Start with step 1 and do each step in the order given. Numbered (or primary) steps tell you WHAT to do. Substeps tell you HOW to do it.

Look at the illustrations. These show you where the equipment and parts are located on the carrier. Illustrations in this manual may show you closeups of equipment, special tools, parts, and other helpful information.

The following examples show you what to look for when reading a task.

Operation Tasks and Maintenance Tasks

Operation tasks tell you how to operate the MLRS carrier and its parts. Each operation task details steps which need to be performed to complete the task.

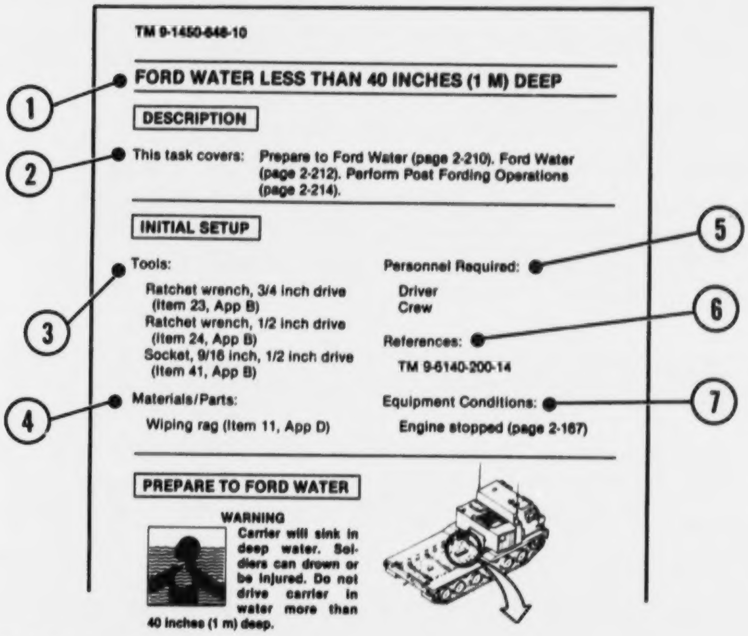
Maintenance tasks help the crew keep the MLRS carrier in operating condition. Crew members are authorized to remove, clean, inspect, lubricate, and install certain parts on the carrier.

Both operation tasks and maintenance tasks use the same format. Look at the example given below.

HOW TO USE THIS MANUAL (cont)

Sample of Setup Items

The sample below shows the DESCRIPTION and INITIAL SETUP sections on the first page of a task. Items to watch for are listed in the legend. Match them with the sample.



TM 9-1450-646-10

FORD WATER LESS THAN 40 INCHES (1 M) DEEP

DESCRIPTION

This task covers: Prepare to Ford Water (page 2-210). Ford Water (page 2-212). Perform Post Fording Operations (page 2-214).

INITIAL SETUP

Tools:

Ratchet wrench, 3/4 inch drive (Item 23, App B)
Ratchet wrench, 1/2 inch drive (Item 24, App B)
Socket, 9/16 inch, 1/2 inch drive (Item 41, App B)

Materials/Parts:

Wiping rag (Item 11, App D)

Personnel Required:

Driver
Crew

References:

TM 9-6140-200-14

Equipment Conditions:

Engine stopped (page 2-167)

PREPARE TO FORD WATER

WARNING

Carrier will sink in deep water. Soldiers can drown or be injured. Do not drive carrier in water more than 40 inches (1 m) deep.

Legend to Sample Above

① **TITLE**	This is the name of the task.
② **DESCRIPTION**	This describes the overall actions you will perform. It also gives you the page where each action begins.
③ **TOOLS**	These are the tools and equipment you will need to do the task.
④ **MATERIALS/ PARTS**	These are the supplies and parts you will need to do the task. These can be obtained from organizational maintenance.

⑤ **PERSONNEL REQUIRED**	These are the personnel needed to do the task.
⑥ **REFERENCES**	These are the other technical publications you will need to do the task.
⑦ **EQUIPMENT CONDITIONS**	These are the conditions the equipment must be in before you start the task. You will be referred to the task or technical publication needed to meet each equipment condition. This reference will be given in parentheses after each equipment condition.

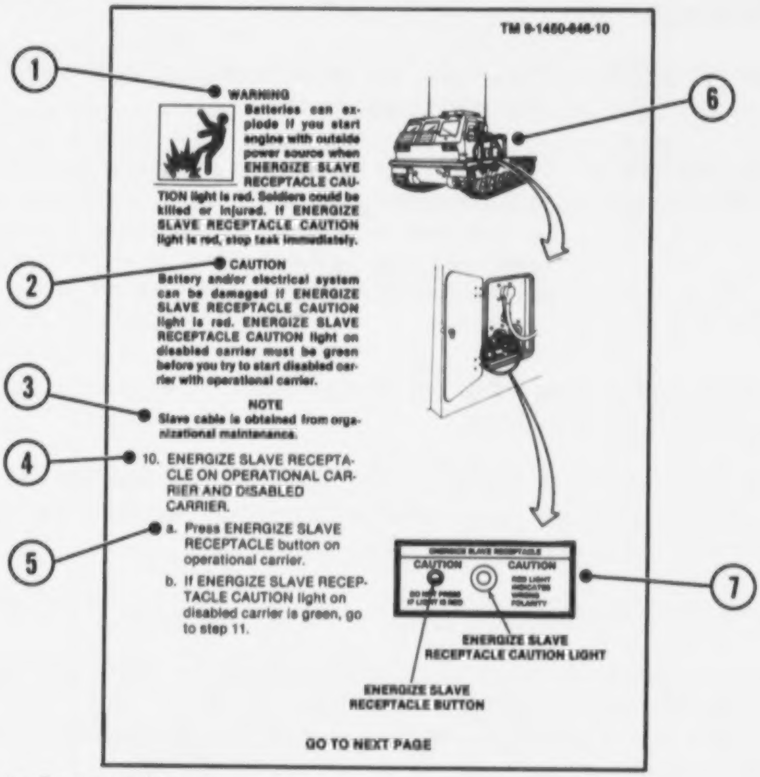
Some tasks will include all of the above items. Other tasks will include only some of the above items.

Read the INITIAL SETUP section carefully before you start any task. Get the tools and supplies listed and the personnel needed. Be sure the equipment is in the condition required.

Sample of Task Steps

The sample below shows you things to watch for when performing a task. Read all steps, substeps, warnings, cautions, and notes before starting the task. Items to watch for are listed in the legend. Match them with the sample.

HOW TO USE THIS MANUAL (cont)



①
②
③
④
⑤
⑥
⑦
CAUTION
CAUTION
ENERGIZE SLAVE RECEPTACLE CAUTION LIGHT
ENERGIZE SLAVE RECEPTACLE BUTTON

TM 9-1450-646-10

WARNING

Batteries can explode if you start engine with outside power source when ENERGIZE SLAVE RECEPTACLE CAUTION light is red. Soldiers could be killed or injured. If ENERGIZE SLAVE RECEPTACLE CAUTION light is red, stop task immediately.

CAUTION

Battery and/or electrical system can be damaged if ENERGIZE SLAVE RECEPTACLE CAUTION light is red. ENERGIZE SLAVE RECEPTACLE CAUTION light on disabled carrier must be green before you try to start disabled carrier with operational carrier.

NOTE

Slave cable is obtained from organizational maintenance.

10. ENERGIZE SLAVE RECEPTACLE ON OPERATIONAL CARRIER AND DISABLED CARRIER.
    a. Press ENERGIZE SLAVE RECEPTACLE button on operational carrier.
    b. If ENERGIZE SLAVE RECEPTACLE CAUTION light on disabled carrier is green, go to step 11.

GO TO NEXT PAGE

Legend to Sample Above

① **WARNING**	This describes danger to yourself and other personnel.
② **CAUTION**	This describes possible damage to equipment.
③ **NOTE**	This tells you about conditions that affect the step immediately following it.
④ **STEP**	This tells you WHAT to do.
⑤ **SUBSTEP**	This tells you HOW to do it.
⑥ **LOCATOR**	This helps you locate equipment on the carrier.
⑦ **CLOSE UP**	This shows you a close up of the equipment.

Some tasks will include all of the above items. Some will not.

Read all of the task before starting. Follow the steps in the order given. The words END OF TASK will tell you when you have finished the task.

Preventive Maintenance Checks and Services

Preventive Maintenance Checks and Services (PMCS) are made on a daily, weekly, and monthly basis. Preventive maintenance must be performed to keep your carrier running.

There are five types of PMCS, as follows:

The BEFORE (B) PMCS should be done just before you operate the carrier.

The DURING (D) PMCS should be done when you operate the carrier. Monitor the carrier systems as you operate the carrier. Perform DURING (D) PMCS on a system only when the system is required to complete your mission.

The AFTER (A) PMCS should be done after completing your mission.

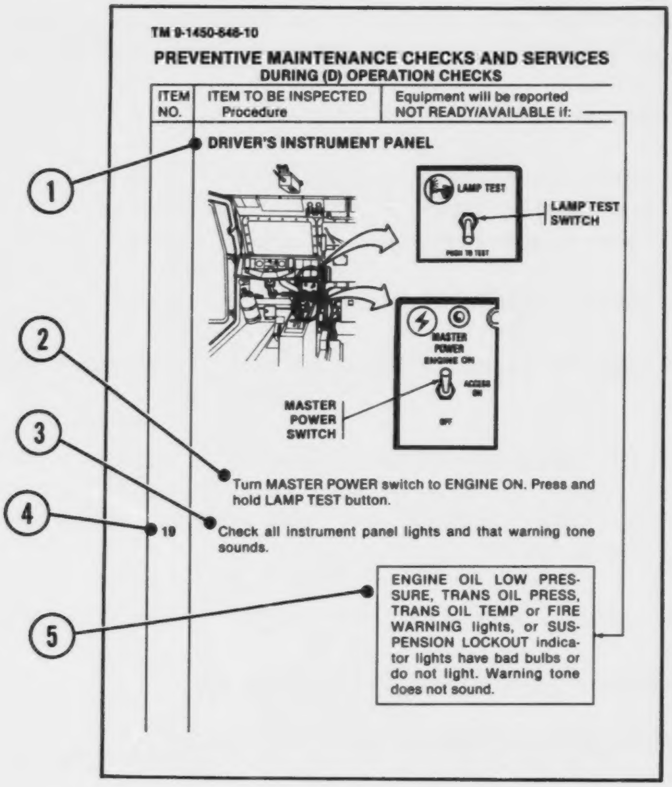
The WEEKLY (W) PMCS should be done weekly.

The MONTHLY (M) PMCS should be done monthly.

If anything seems wrong with the carrier or its systems and you cannot fix it yourself, notify organizational maintenance. Use DA Form 2404. Common things to watch for in every area inspected are loose bolts or damaged welds. Watch for wear, leaks, loose clamps, and loose fittings when checking hoses and fluid lines.

The following sample shows you what to look for when you read a PMCS procedure. For more information on PMCS, see page 2-35.

HOW TO USE THIS MANUAL (cont)



TM 9-1450-646-10

PREVENTIVE MAINTENANCE CHECKS AND SERVICES
DURING (D) OPERATION CHECKS

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	DRIVER'S INSTRUMENT PANEL	
	Turn MASTER POWER switch to ENGINE ON. Press and hold LAMP TEST button.	
19	Check all instrument panel lights and that warning tone sounds.	ENGINE OIL LOW PRESSURE, TRANS OIL PRESS, TRANS OIL TEMP or FIRE WARNING lights, or SUSPENSION LOCKOUT indicator lights have bad bulbs or do not light. Warning tone does not sound.

Legend to Sample Above

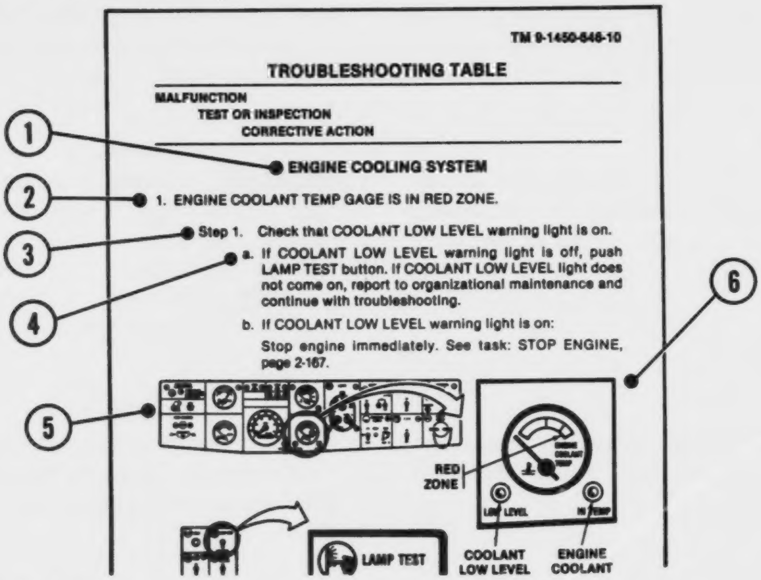
① **TITLE**	This is the name of the carrier system or part being checked.
② **STEP(S)**	This tells you what needs to be done before and after you do the check.
③ **CHECK**	This tells you what to check.
④ **ITEM NUMBER**	This tells you the sequence for doing the PMCS.
⑤ **NOT READY/ AVAILABLE CONDITION**	This tells you what conditions will have to be corrected before you perform your mission.

Troubleshooting Tasks

Troubleshooting tasks help the crew solve common problems and malfunctions. The Troubleshooting Symptom Index on page 3-3 lists some malfunctions common to your carrier. You will be guided to the Troubleshooting Table by the Troubleshooting Symptom index.

Sample of Troubleshooting Task

The sample below shows you things to watch for when performing a troubleshooting task. Items to watch for are listed in the legend. Match them with the sample.



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TROUBLESHOOTING TABLE

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

ENGINE COOLING SYSTEM

1. ENGINE COOLANT TEMP GAGE IS IN RED ZONE.

Step 1. Check that COOLANT LOW LEVEL warning light is on.

a. If COOLANT LOW LEVEL warning light is off, push LAMP TEST button. If COOLANT LOW LEVEL light does not come on, report to organizational maintenance and continue with troubleshooting.

b. If COOLANT LOW LEVEL warning light is on:

Stop engine immediately. See task: STOP ENGINE, page 2-167.

Legend to Sample Above

① **SYSTEM**	This tells you which carrier system the troubleshooting task is covering.
② **MALFUNCTION**	This tells you the carrier malfunction.
③ **TEST OR INSPECTION**	This tells you the test or inspection you should make to find the cause of the malfunction.
④ **CORRECTIVE ACTION**	This tells you what to do to fix the malfunction.

HOW TO USE THIS MANUAL (cont)

⑤ **LOCATOR**	This helps you locate equipment on the carrier.
⑥ **CLOSEUP**	This shows you a closeup of the equipment.

DEFINITION OF TASK TERMS

WARNINGS, CAUTIONS, AND NOTES

Pay attention to all warnings and cautions within the task. Ignoring a warning could cause death or injury to yourself or other personnel. Ignoring a caution could cause damage to equipment. Notes contain facts to make the task easier. Warnings, cautions, and notes always appear just above the step to which they apply.

WARNINGS: Call attention to things that could kill or injure personnel. Warnings are also listed at the front of the manual.

WARNING

Falling grille could hurt you. Be sure strut is in locked position before working under grille.

CAUTIONS: Call attention to actions or materials that could damage equipment.

CAUTION

Improper cable removal can cause a short circuit. Remove negative cable before you remove positive cable.

NOTES: Contain important facts to make the task easier.

NOTE

It may be necessary to use a sledge hammer and crowbar to break track.

HELPER

Helpers are needed in tasks that require more than one person. A helper may be needed to help lift heavy objects or act as an outside observer.

If a helper is needed to perform a task, the INITIAL SETUP will tell you.

Example: Personnel Required:
Driver
Helper (H)

If a helper assists with a step, the step will include: "Have helper assist."

Example: 3. REMOVE TRACK SHOE FROM STRETCHED TRACK. HAVE HELPER ASSIST.

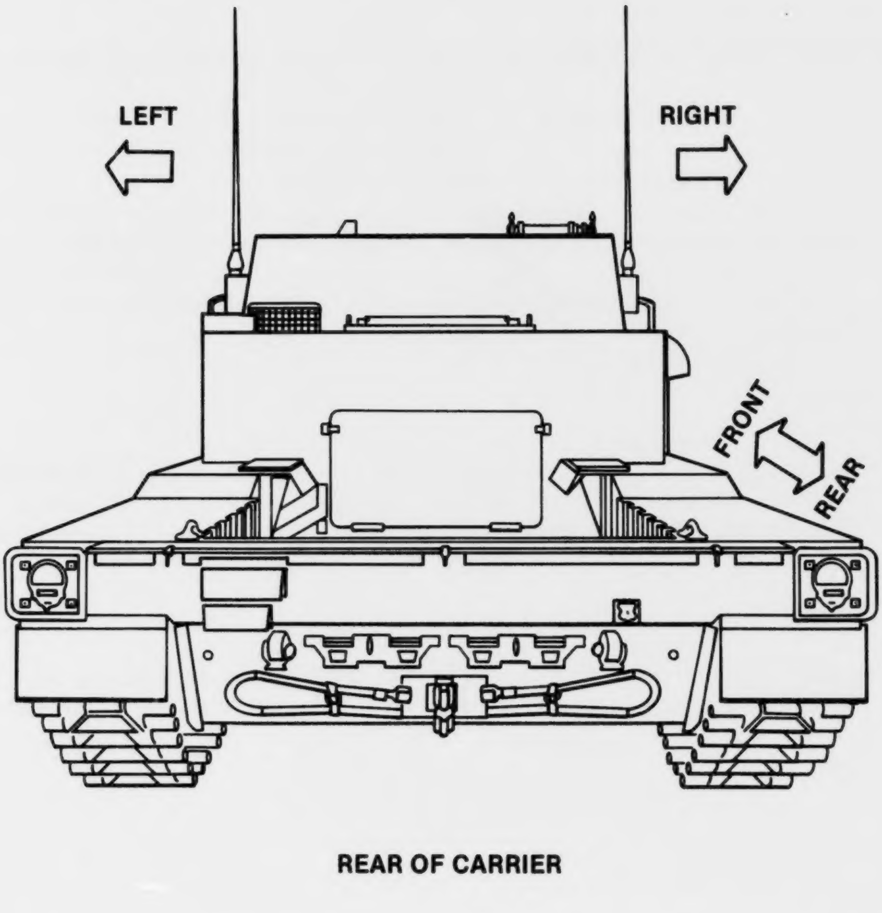
If a helper performs the action alone, the step will start with "(H)".

Example: 2. (H) MOVE MASTER POWER SWITCH TO ENGINE ON.

HOW TO USE THIS MANUAL (cont)

LOCATIONAL TERMS

The terms "front", "rear", "left", and "right" are used to indicate where items are located on the carrier. Think of these locations as if you were standing in the carrier bed facing the cab.



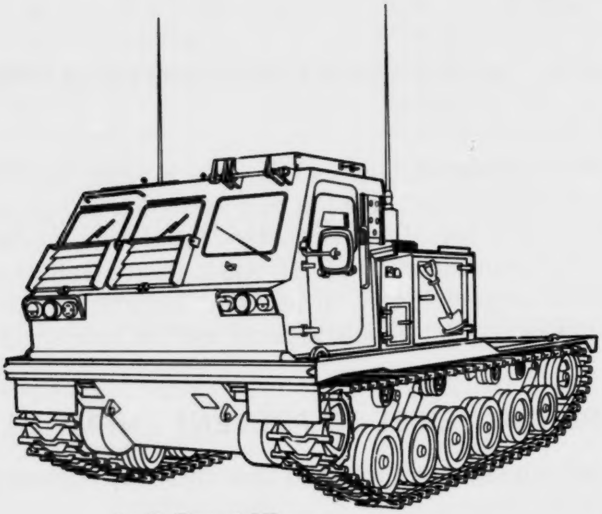
REAR OF CARRIER

CHAPTER 1

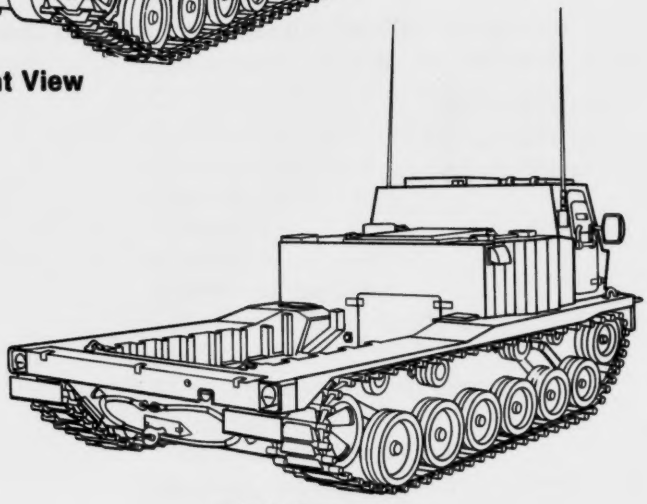
INTRODUCTION

Section I. GENERAL INFORMATION

MULTIPLE LAUNCH ROCKET SYSTEM (MLRS) CARRIER



Left Front View



Right Rear View

GENERAL INFORMATION (cont)

SCOPE

This manual tells how to operate and maintain the MLRS carrier.

MAINTENANCE FORMS AND RECORDS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-750, the Army Maintenance Management System (TAMMS).

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your MLRS carrier needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Tell us why a procedure is hard to perform. Put your ideas on an SF 368 (Quality Deficiency Report). Mail it to us at: Commander, U.S. Army Tank Automotive Command, ATTN: DRSTA-MP, Warren, MI 48090. A reply will be furnished to you.

DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

The following manuals tell you how and when to destroy Army materiel to prevent enemy use:

TM 750-244-2
TM 750-244-5-1
TM 750-244-6

NOMENCLATURE CROSS REFERENCE LIST

This listing includes nomenclature cross references used in this manual.

COMMON NAME	*OFFICIAL NOMENCLATURE*
Breaker bar	Handle, socket wrench
Cab	Driver's compartment
CBR	NBC
Dipstick	Gage rod
Engine and transmission	Power unit
Fire extinguisher	Fire suppression cylinder
Halon	CF_3 Br
Heater	Personnel heater
MLRS carrier	Multiple Launch Rocket System carrier
Windshield	Transparent armor

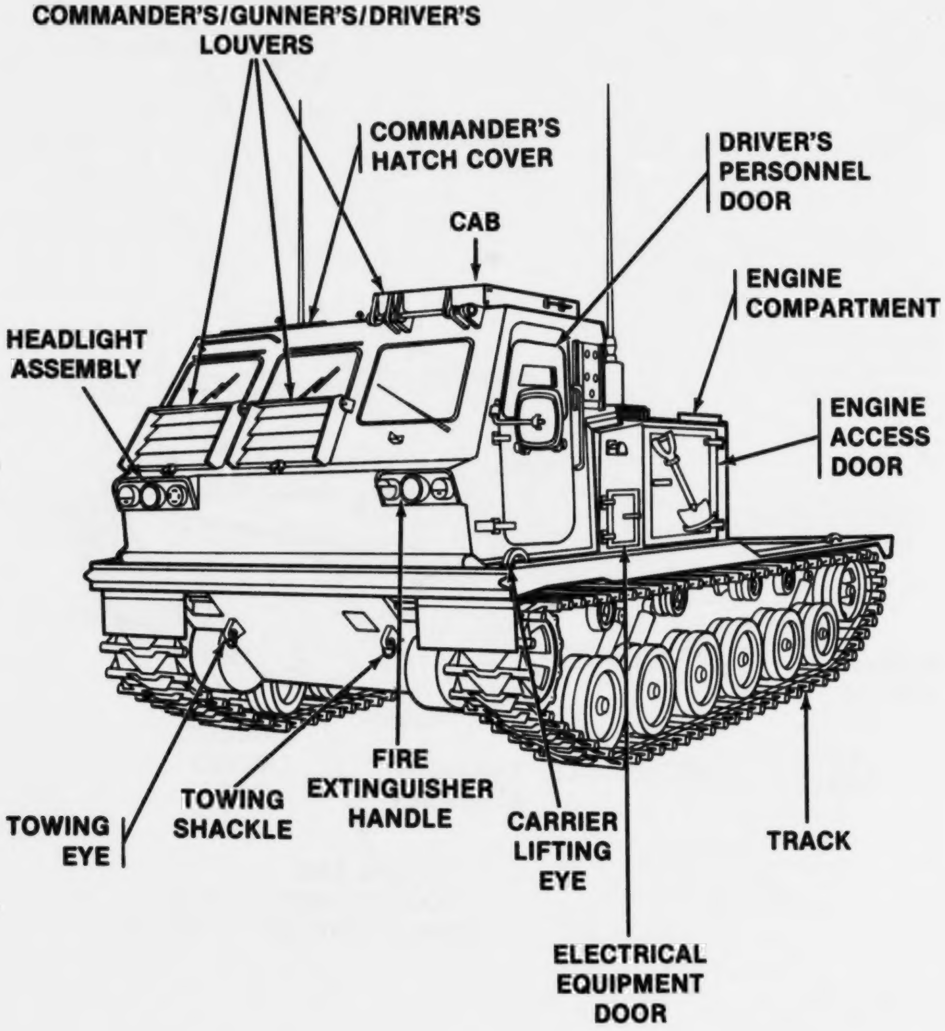
LIST OF ABBREVIATIONS

Many abbreviations are used in this manual. They are listed below. Learn what each one means. It will make your job easier.

ABBREVIATION	*MEANING*
BO	Blackout
CM	Centimeter
CPM	Centimeter per minute
CVC	Combat Vehicle Communication
EIR	Equipment Improvement Recommendation
GPM	Gallons per minute
KG	Kilogram
KM	Kilometer
KM / H	Kilometer per hour
LLM	Launcher Loader Module
M	Meter
MLRS	Multiple Launcher Rocket System
MPH	Miles per hour
MWO	Modification Work Order
NBC	Nuclear, Biological, and Chemical
PMCS	Preventive Maintenance Checks and Services
RPM	Revolutions per minute
SLO	Suspension lockout

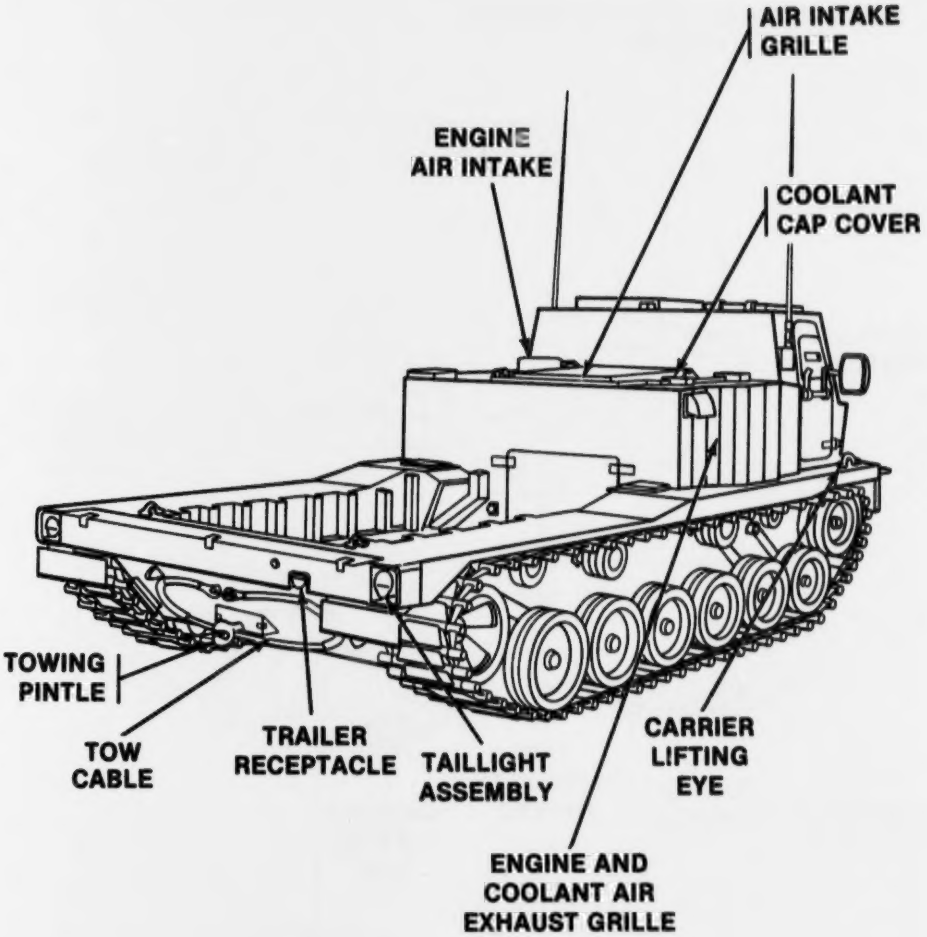
Section II. EQUIPMENT DESCRIPTION

MULTIPLE LAUNCH ROCKET SYSTEM (MLRS) CARRIER

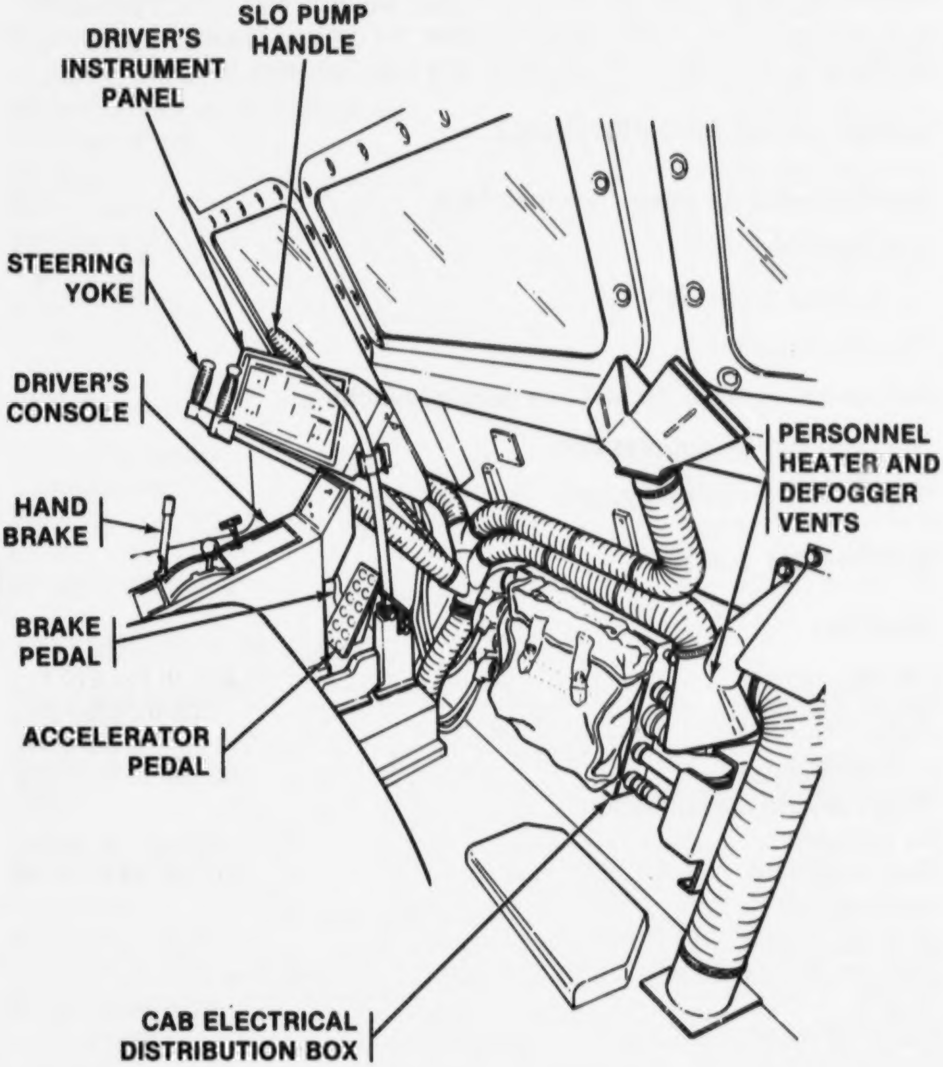

COMMANDER'S/GUNNER'S/DRIVER'S LOUVERS
COMMANDER'S HATCH COVER
DRIVER'S PERSONNEL DOOR
CAB
ENGINE COMPARTMENT
HEADLIGHT ASSEMBLY
ENGINE ACCESS DOOR
FIRE EXTINGUISHER HANDLE
TOWING EYE
TOWING SHACKLE
CARRIER LIFTING EYE
TRACK
ELECTRICAL EQUIPMENT DOOR

Left Front View

EQUIPMENT DESCRIPTION (cont)


AIR INTAKE GRILLE
ENGINE AIR INTAKE
COOLANT CAP COVER
TOWING PINTLE
TOW CABLE
TRAILER RECEPTACLE
TAILLIGHT ASSEMBLY
CARRIER LIFTING EYE
ENGINE AND COOLANT AIR EXHAUST GRILLE

Right Rear View


DRIVER'S INSTRUMENT PANEL
SLO PUMP HANDLE
STEERING YOKE
DRIVER'S CONSOLE
HAND BRAKE
BRAKE PEDAL
ACCELERATOR PEDAL
PERSONNEL HEATER AND DEFOGGER VENTS
CAB ELECTRICAL DISTRIBUTION BOX

Cab Interior

PURPOSE

The MLRS carrier is a light, armored rocket weapon platform. It provides mobile long range artillery rocket support for ground forces. The armored cab permits completion of an entire fire mission from the cab interior.

CAPABILITIES AND FEATURES

Seating in cab for three crew members

Fully tracked

Light armor protection

Fording capability

Suspension lockout for stability during launching

Equipped for fire suppression

Stabilized fire control system

EQUIPMENT DATA

GENERAL

Weight, carrier	32,200 lb (14,619 kg)
Height clearance	102 in. (259 cm)
Crew	3 persons
Fuel tank capacity	163 gal (617 liters)
Bridge weight classification	28
Air transport	C-141 aircraft or larger
Engine coolant	22 gal (82.6 liters)

PERFORMANCE

Top speed	40 mph (64 kph)
Stopping distance (20 to 0 mph) (32 to 0 kph)	28 ft (8.5 m)
Range, speed at 25 mph (40 kph)	300 mi (483 km)
Turning radius	pivot to infinite
Slope	60% (32 degrees)
Side Slope	40% (22 degrees)
Vertical wall	30 in. (76 cm)
Trench	91 in. (231 cm)
Water fording	40 in. (102 cm)
HP to Weight	18/ton

ENGINE

Make and model	Cummins VTA-903T
Displacement	903 cu in. (14.8 liters)
Type	4 cycle
Fuel	Diesel
Gross horsepower	500 (506 metric)

TRANSMISSION, AUTOMATIC

Make and model	GE. HMPT-500
Type	Hydromechanical
Steering	Hydrostatic
Brake	Multidisc, oil-cooled

RUNNING GEAR

Suspension	Return roller
Springing media	Torsion bar type
Number of road wheels	6 pairs per side
Road wheel size:	
Diameter	24 in. (61.0 cm)
Width	4 in. (10.2 cm)
Track type	Steel single pin with detachable rubber pads
Shock absorbers	3 per side
Number of track shoes	89 left side 88 right side
Track pitch	6 in. (15.2 cm)

EQUIPMENT DATA (cont)

Track width	21 in. (53.3 cm)
Suspension lockout	1, 5, and 6 road arms

ELECTRICAL SYSTEM:

Generator:	
Amperes	220 amp
Volts, dc	regulated to 28 V
Batteries (carrier only)	four each, type 6TN, 100 amp hr, 12 V each

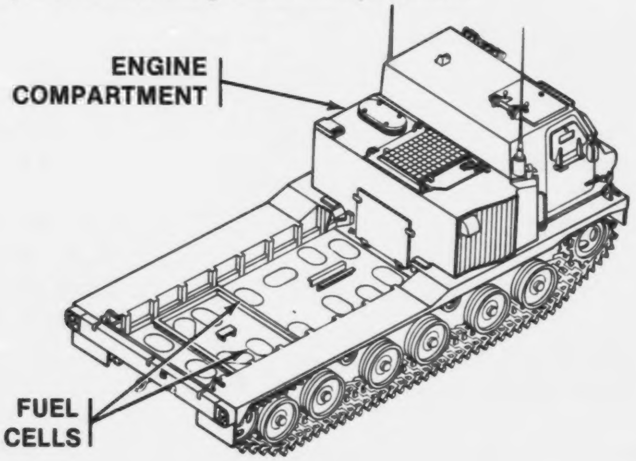
FIRE EXTINGUISHERS:

Fixed:	
Engine compartment	7 lb (3.2 kg) Halon
Portable	2.75 lb (1.2 kg) Halon

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

ENGINE COMPARTMENT. The engine compartment is located to the rear of the cab. The engine and transmission are located in this compartment. The engine powers the transmission which drives the carrier tracks.

FUEL CELLS. Diesel fuel is stored in two separate but interconnected cells. The cells are located in the lower hull, between the floor plates and bottom hull plate of the cargo bed compartment.



CREW VENTILATION AND HEATING. A vent fan provides fresh air for the crew. It is also used to keep exhaust fumes from entering the cab during rocket firing. The personnel heater is located in the front of the cab and operates on diesel fuel. It is used to warm and regulate cab air and to defog the inside of the windshields.

TRACK AND SUSPENSION SYSTEM. The track and suspension system helps propel the carrier and provides a cushioned ride. The main parts of the track and suspension system are as follows:

Drive sprockets. The drive sprockets deliver power from the power unit to the tracks.

Tracks. The tracks are closed chains of track shoes driven by the drive sprockets.

Road wheels. The road wheels support the hull on the tracks.

Road arms. The road arms connect the road wheels to the torsion bars. The road arms pivot to press the road wheels against the tracks.

Torsion bars. The torsion bars are springs for the road arms.

Shock absorbers. The shock absorbers work with the torsion bars to reduce bounce on rough ground.

Idler wheels. The idler wheels support the rear track loop ends and keep the tracks tight.

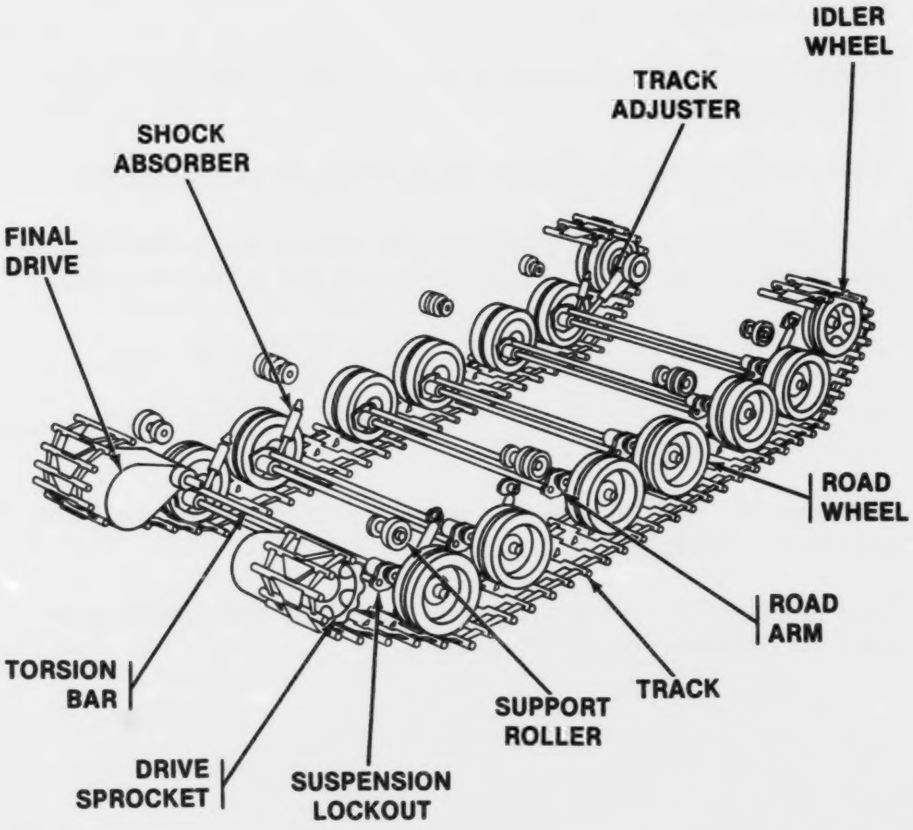
Track adjusters. The track adjusters permit the idler wheels to be moved to tighten or loosen the tracks.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS (cont)

Support Rollers. The support rollers keep the top of the track from hitting the road wheels.

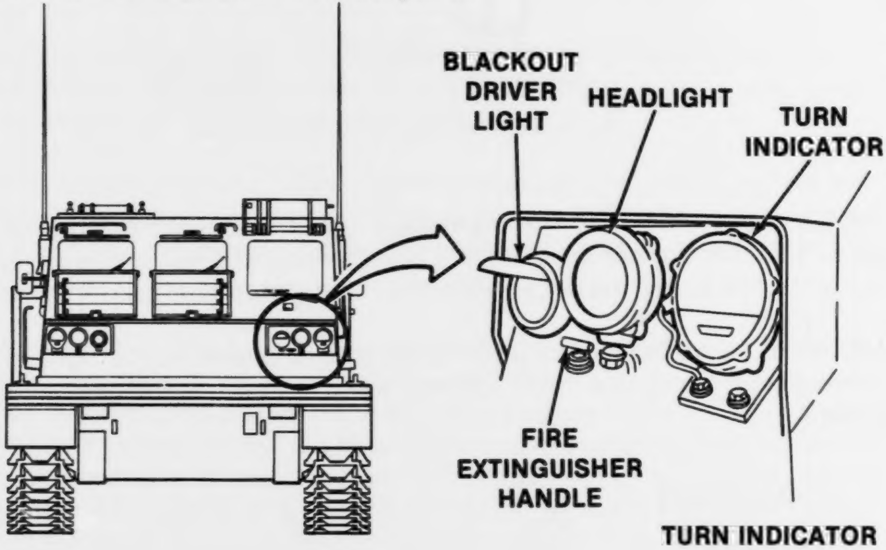
Suspension lockout. The suspension lockout holds the carrier and suspension steady during loading and launch operations.

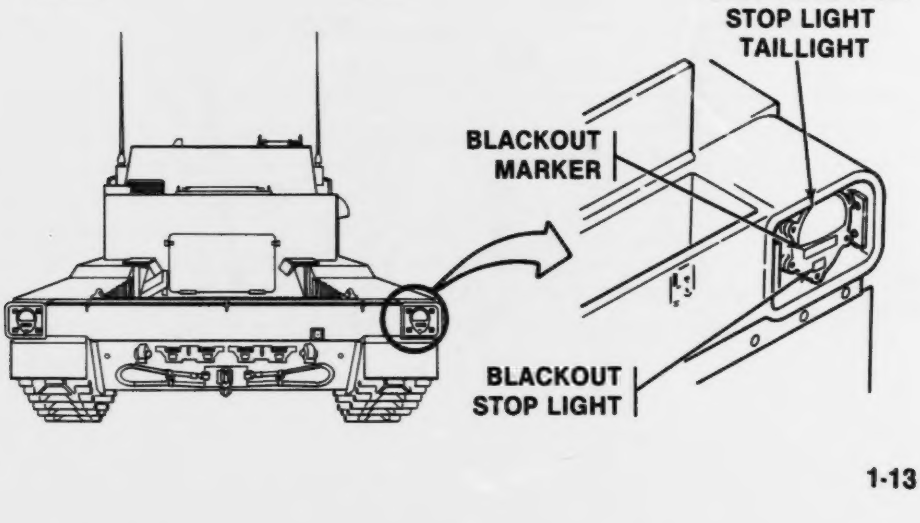
Final drives. The final drives deliver power from the transmission to the drive sprockets.


IDLER WHEEL
TRACK ADJUSTER
SHOCK ABSORBER
FINAL DRIVE
ROAD WHEEL
ROAD ARM
TRACK
SUPPORT ROLLER
TORSION BAR
DRIVE SPROCKET
SUSPENSION LOCKOUT

FIRE SUPPRESSION SYSTEM. The fire suppression system releases halon to quickly put out fires in the engine compartment. It consists of a fixed fire extinguisher located in the front of the cab to the left of the driver. It is manually activated by release handles from either inside or outside the carrier. A portable fire extinguisher is located in front of the driver's console.

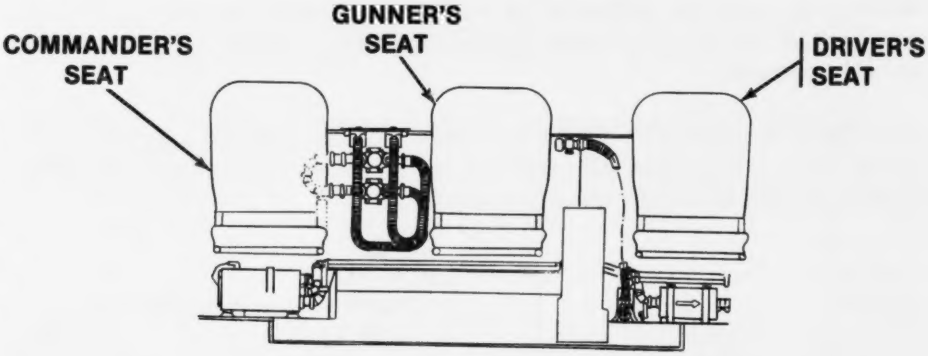
EXTERIOR LIGHTING. Exterior lights include blackout lights, headlights, stop lights, and turn indicators. They are operated by switches located on the driver's instrument panel.


BLACKOUT DRIVER LIGHT
HEADLIGHT
TURN INDICATOR
FIRE EXTINGUISHER HANDLE


TURN INDICATOR STOP LIGHT TAILLIGHT
BLACKOUT MARKER
BLACKOUT STOP LIGHT

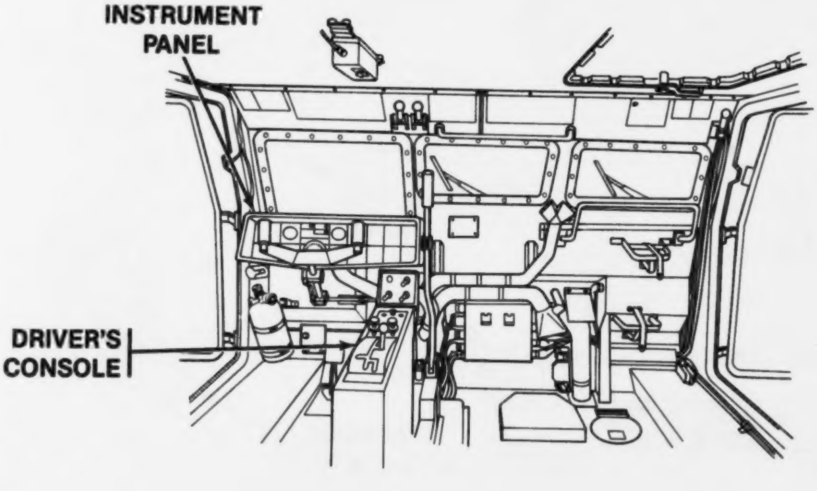
LOCATION AND DESCRIPTION OF MAJOR COMPONENTS (cont)

SEATS. The carrier is equipped with separate seats for the commander, gunner, and driver. The seats are located in the cab.


GUNNER'S SEAT
COMMANDER'S SEAT
DRIVER'S SEAT

INSTRUMENT PANEL. The instrument panel is located in front of the driver's seat. It contains the driver's instruments, and warning and indicator lights. They keep the driver informed of the status of all carrier systems.

DRIVER'S CONSOLE. The driver's console is located to the right of the driver's seat. It contains driver's controls and indicators, and gear selector panel.


INSTRUMENT PANEL
DRIVER'S CONSOLE

Section III. TECHNICAL PRINCIPLES OF OPERATION

CAB AND HULL

COMMANDER'S HATCH COVER. The commander's hatch cover is located over the commander's seat. It can be latched in the CLOSED, POP-UP and OPEN positions. It opens and closes on a set of hinges and is spring-loaded with a torsion bar.

PERSONNEL DOORS. The personnel doors are located on the right and left sides of the cab. They open and close on a set of hinges and can be latched in OPEN and CLOSED positions.

ENGINE ACCESS DOOR. The engine access door is located on the left side of the cab. The door provides access to the engine without raising the cab. A release pin latches the door open.

ENGINE ACCESS PANEL. The engine access panel is located on the rear of the engine compartment. It provides access to the engine without raising the cab. The engine access panel is held in place by two fasteners with tee screws.

DRAIN PLUGS. The carrier has two drain plugs located in the front of the hull, two drain plugs located in the rear of the hull, two drain plates located in the front left side of the hull, and one center drain hole with a cover located in the center hull bed. There is also one drain plug between the fuel cells and two drain plugs under the final drives. These drain plugs are designed to quickly drain the carrier of water and other liquids. There are two fuel drain plugs located under the hull on the rear left side of the carrier.

LOUVERS. The front windshields have louvers which protect the crew during launch. The louvers can be secured in either stowed or battle position. The driver's louver is located on the top left of the cab in stowed position. It is spring-loaded and can be locked in stowed or battle position. The commander's and gunner's louvers are located on the front slope of the cab in stowed position. They are held in stowed or battle position by quick release pins. The driver's, commander's, and gunner's louvers can be opened or closed when in battle position by control handles located inside the cab.

TECHNICAL PRINCIPLES OF OPERATION (cont)

DRIVER'S CONTROLS.

The engine, transmission, steering system, and braking system are driver controlled. Engine startup and shut down are controlled by electrical signals and mechanical linkages connected to the accelerator pedal, the fuel shutoff cable, and the hand throttle cable. Steering and braking are controlled through linkages connected to the transmission. The hand brake is hand controlled.

ENGINE SYSTEM AND DRIVE TRAIN.

The engine converts air and diesel fuel into energy. The engine delivers power to the transmission. The transmission delivers power to the generator, cooling fan, steering and final drives. Air for combustion flows through the air cleaner, turbocharger, and the engine. Fuel flows from the fuel tank to fuel injectors which inject the fuel into the combustion chambers. A drive train transfers power from the engine to the carrier tracks. The drive train consists of the engine, transmission, drive lines, final drive assemblies, and drive sprockets.

COOLANT SYSTEM.

The engine and transmission generate heat during normal operation. The coolant system transfers some of this heat to the outside to maintain safe operating temperatures. A mixture of antifreeze and water is pumped through the coolant system to cool the engine and transmission. The engine coolant system has a capacity of 22 gallons (82.6 liters).

ELECTRICAL SYSTEM.

The carrier electrical system operates on four lead acid batteries connected in a series / parallel arrangement. The batteries give power to start the engine and provide power to the electrical system when the engine is shut down. Electrical power flows from the batteries through the distribution box, cables, subsystems, and assemblies. The carrier electrical system provides power for the lights, indicators, vent fans, heater, and fire detection system. A DC generator provides power to the carrier and launcher batteries when the engine is running.

LAUNCHER SAFETY SYSTEM.

The launcher safety system alerts crew to unsafe cab conditions during launcher firing. The system is an electrical series circuit. Safety switches mounted near cab doors, windows, and commander's hatch cover signal when openings are not closed all the way. The cab fan control and vent filtration handle switches are part of the system. A green light on the left side of the cab distribution box signals when the cab is safe for launcher firing.

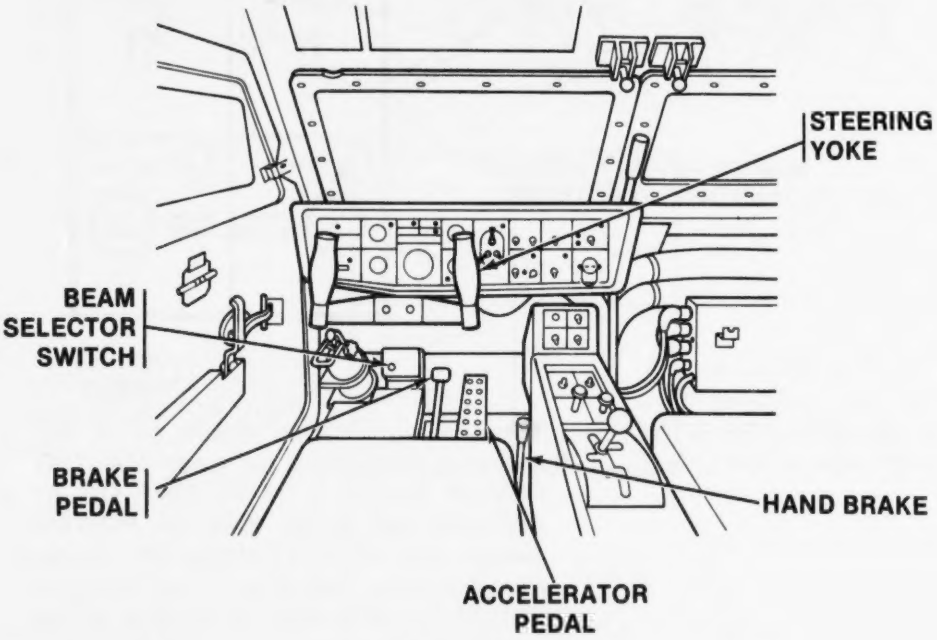
NUCLEAR, BIOLOGICAL, AND CHEMICAL (NBC) SYSTEM.

The NBC system cleans and filters air and sends clean air to crew through crew masks.

CHAPTER 2
OPERATING INSTRUCTIONS

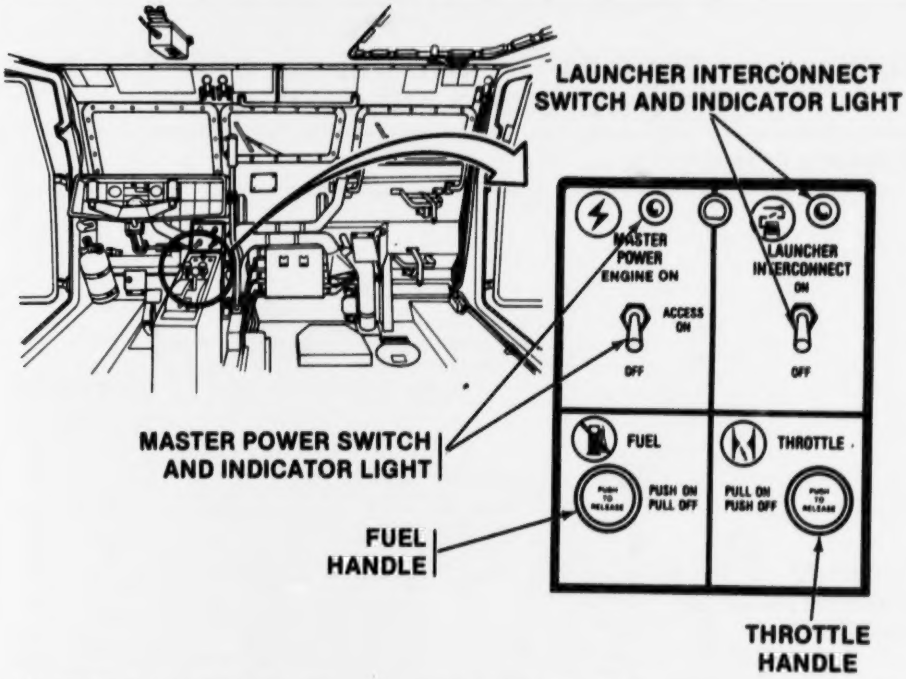
Section I. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS

DRIVER'S CONTROLS

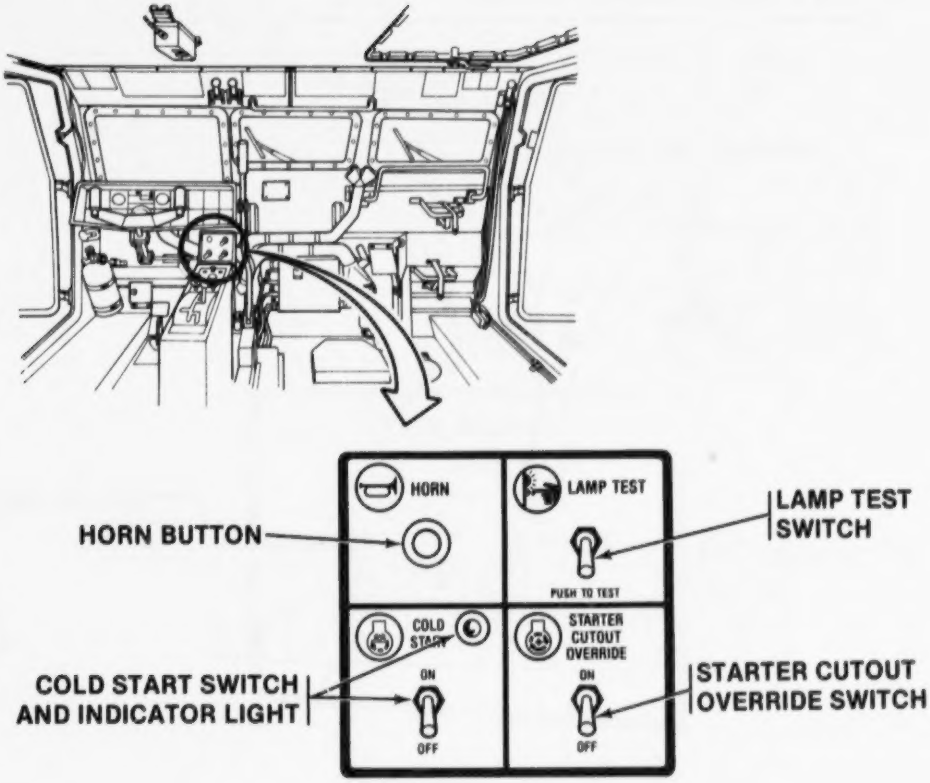

STEERING YOKE
BEAM SELECTOR SWITCH
BRAKE PEDAL
HAND BRAKE
ACCELERATOR PEDAL

STEERING YOKE	Steers carrier.
BRAKE PEDAL	Slows and stops carrier.
ACCELERATOR PEDAL	Controls engine speed.
HAND BRAKE	Engages parking brake.
BEAM SELECTOR SWITCH	Selects high or low headlight beams.

DRIVER'S CONSOLE

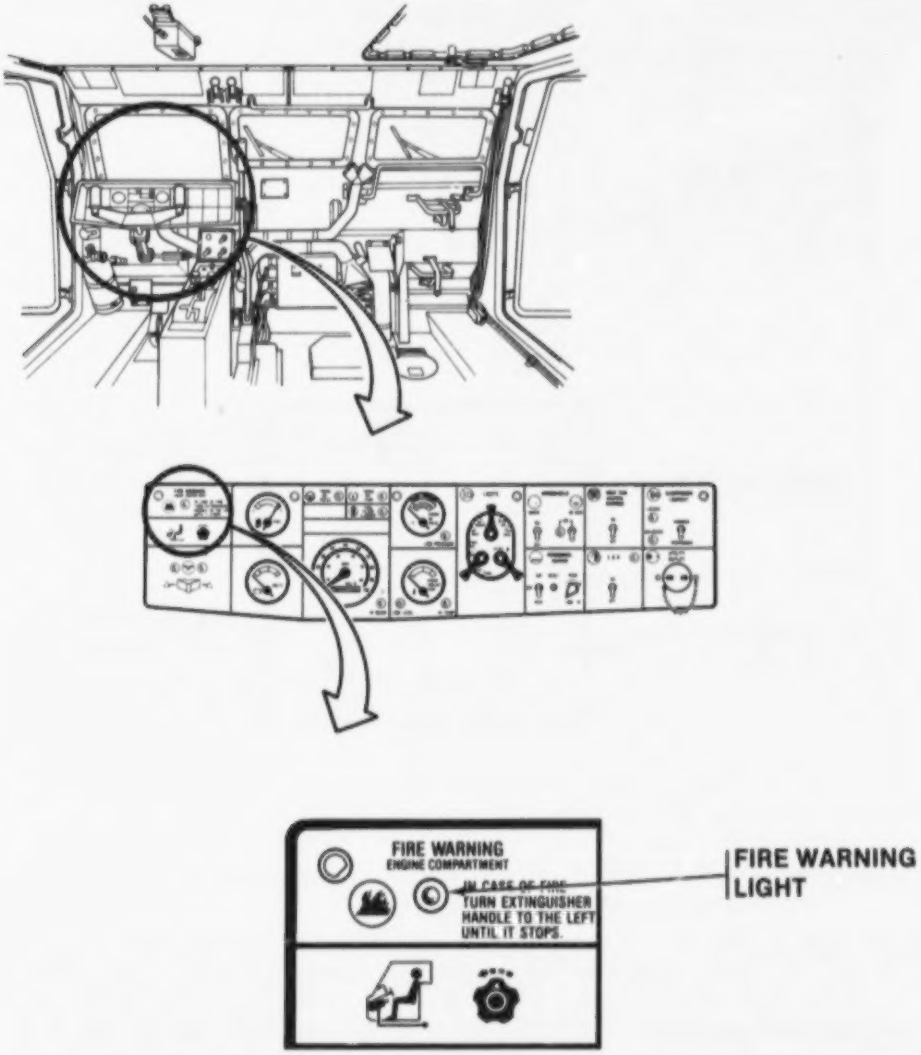

LAUNCHER INTERCONNECT SWITCH AND INDICATOR LIGHT
MASTER POWER ENGINE ON
ACCESS ON
OFF
LAUNCHER INTERCONNECT ON
OFF
FUEL
PUSH TO RELEASE
PUSH ON PULL OFF
THROTTLE
PULL ON PUSH OFF
PUSH TO RELEASE
MASTER POWER SWITCH AND INDICATOR LIGHT
FUEL HANDLE
THROTTLE HANDLE

MASTER POWER SWITCH AND INDICATOR LIGHT	Turns primary carrier power on or off. Indicator light goes on when MASTER POWER switch is at ENGINE ON or ACCESS ON. When MASTER POWER switch is in ACCESS ON position, power to cab accessories is on. When MASTER POWER is in ENGINE ON position, entire system is energized for engine startup.
LAUNCHER INTERCONNECT SWITCH AND INDICATOR LIGHT	Allows carrier charging system to charge launcher batteries. Indicator light goes on when LAUNCHER INTERCONNECT switch is off.
FUEL HANDLE	Controls fuel to engine.
THROTTLE HANDLE	Allows engine speed to be controlled by hand for warmup or launcher operations.

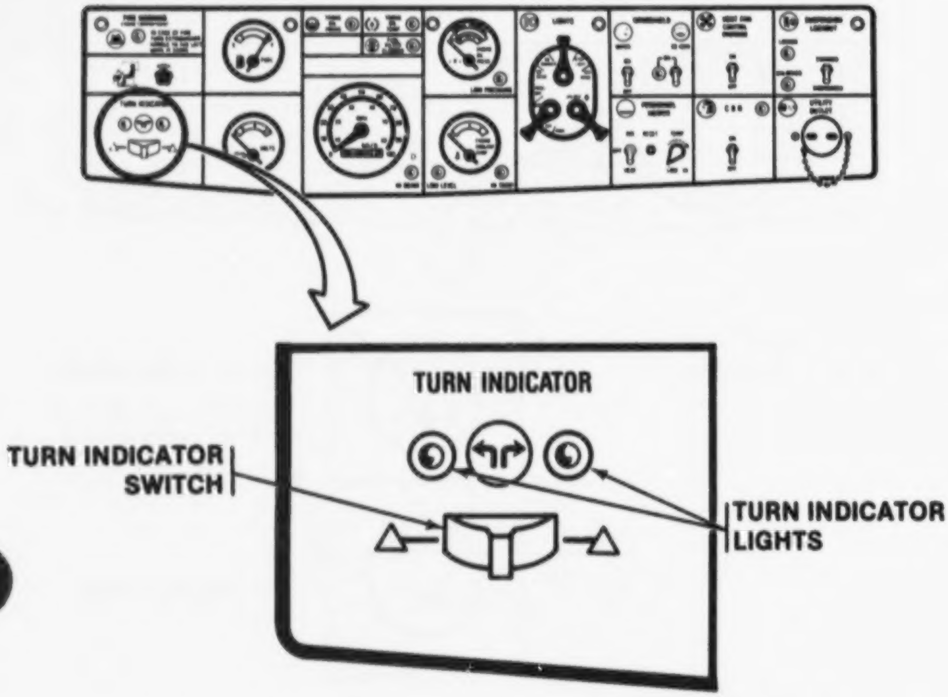

HORN
LAMP TEST
PUSH TO TEST
COLD START
ON
OFF
STARTER CUTOUT OVERRIDE
ON
OFF
HORN BUTTON
LAMP TEST SWITCH
COLD START SWITCH AND INDICATOR LIGHT
STARTER CUTOUT OVERRIDE SWITCH

HORN BUTTON	Sounds horn when pushed.
LAMP TEST SWITCH	Lights all indicator lamps and sounds warning tone when pushed.
COLD START SWITCH AND INDICATOR LIGHT	Used while starting engine during cold weather +40°F to -25°F (+4°C to -10°C). Heats glow plugs. Indicator light goes on when COLD START switch is on.
STARTER CUTOUT OVERRIDE SWITCH	Allows starter to crank longer in cold start conditions. Overrides automatic starter cutout.

DRIVER'S INSTRUMENT PANEL

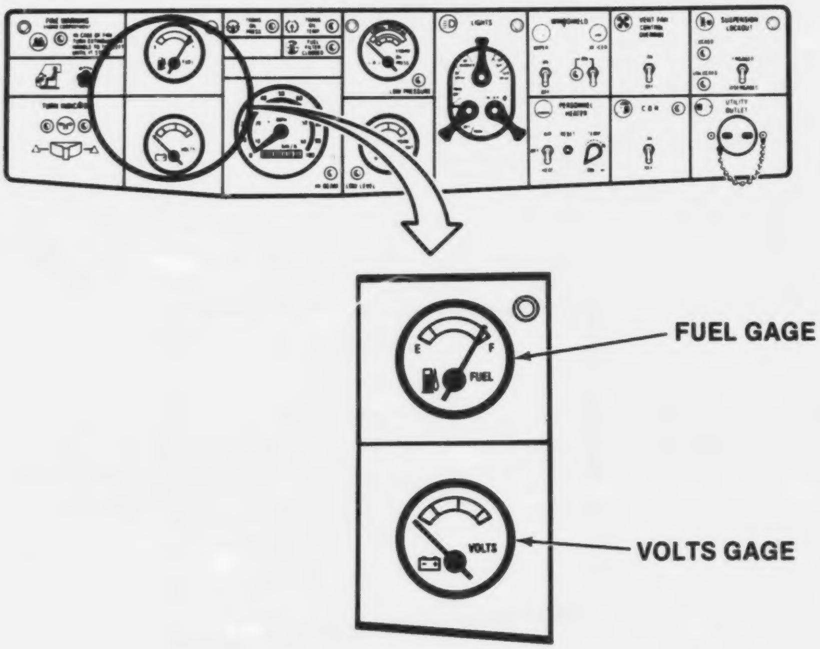

FIRE WARNING
ENGINE COMPARTMENT
IN CASE OF FIRE
TURN EXTINGUISHER
HANDLE TO THE LEFT
UNTIL IT STOPS.
FIRE WARNING LIGHT

FIRE WARNING LIGHT	Indicates fire in engine compartment.

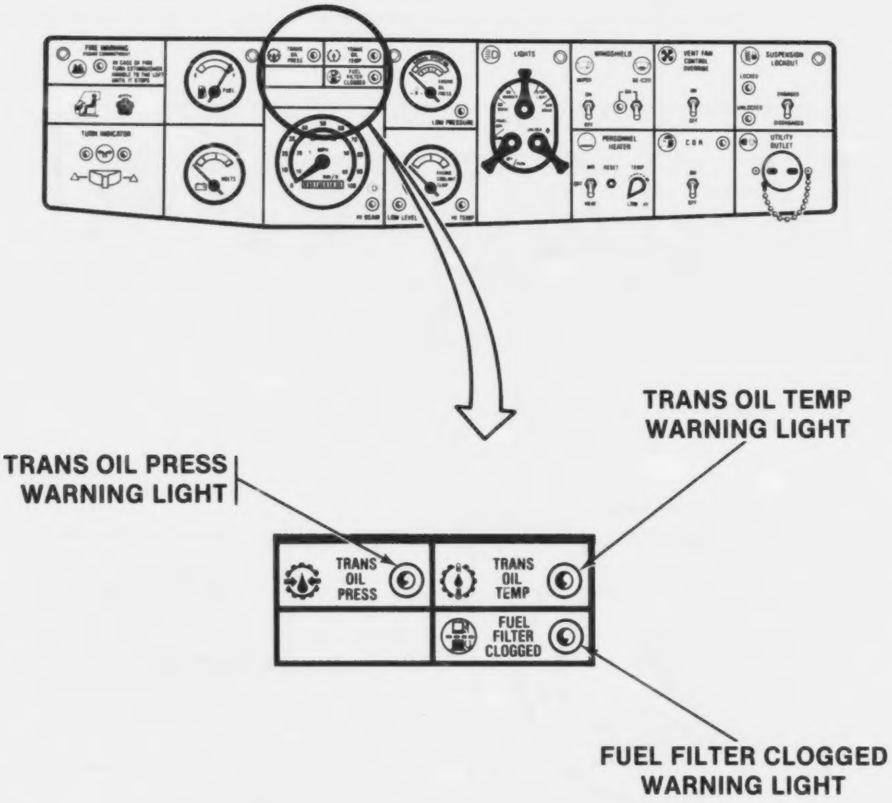

TURN INDICATOR
TURN INDICATOR SWITCH
TURN INDICATOR LIGHTS

TURN INDICATOR SWITCH	Five-position switch controls turn indicator lights as follows: Center position is off. Switch the first detent left of center turns on left directional lights. Switch at first detent right of center turns on right directional lights. Switch at far left or far right turns on hazard lights.
TURN INDICATOR LIGHTS	Left or right turn indicator light comes on to match setting of switch. Both turn indicator lights come on when switches are set to hazard light position.

DRIVER'S INSTRUMENT PANEL (cont)

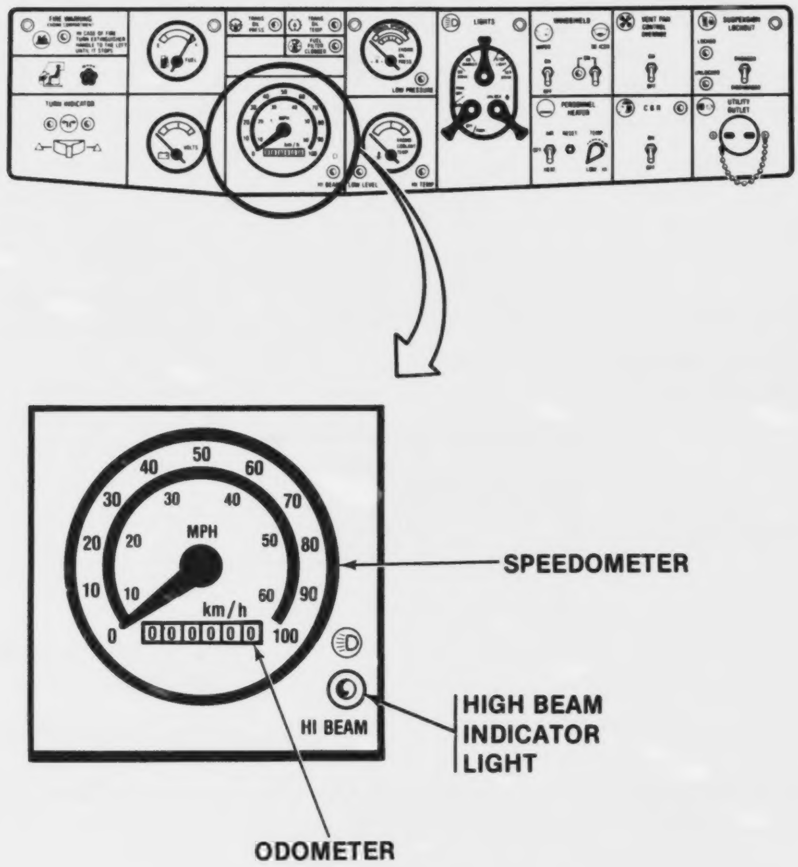


FUEL GAGE	Indicates level of fuel in fuel cells.
VOLTS GAGE	Indicates battery and generator conditions as follows: Left red zone — Indicates low battery charge with engine off. Battery may not start engine. Yellow zone — Indicates normal battery voltage with engine off. Indicates generator not charging with engine running. Green zone — Indicates generator charging normally with engine running. Right red zone — Indicates generator overcharging with engine running.

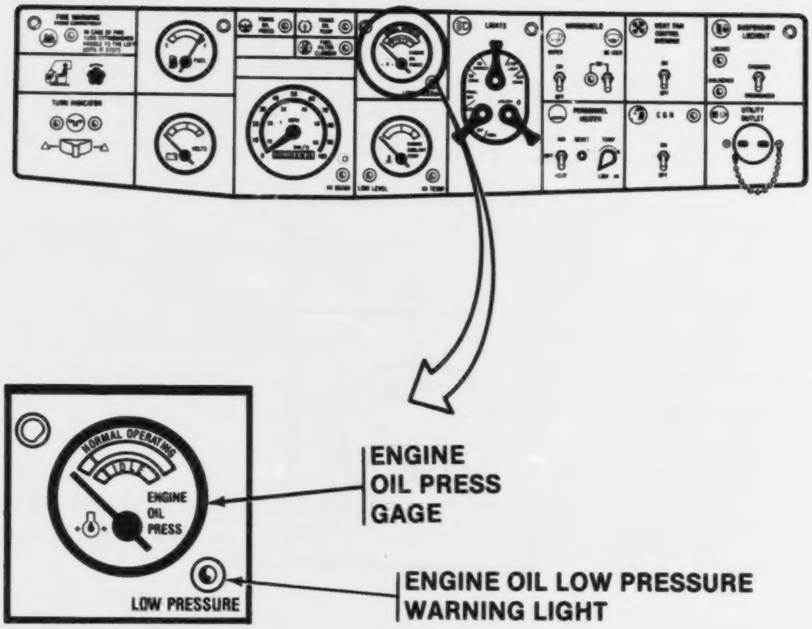

TRANS OIL TEMP WARNING LIGHT
TRANS OIL PRESS WARNING LIGHT
TRANS OIL PRESS
TRANS OIL TEMP
FUEL FILTER CLOGGED
FUEL FILTER CLOGGED WARNING LIGHT

TRANS OIL PRESS WARNING LIGHT	Goes on when transmission oil pressure is low.
TRANS OIL TEMP WARNING LIGHT	Goes on when transmission oil temperature is too hot.
FUEL FILTER CLOGGED WARNING LIGHT	Goes on when fuel filter is clogged and engine is running.

DRIVER'S INSTRUMENT PANEL (cont)

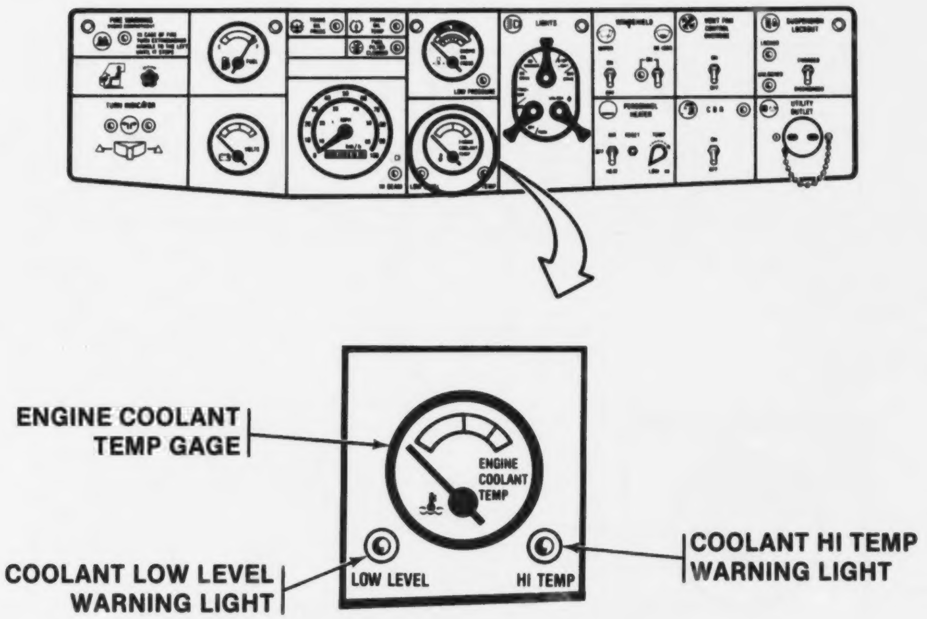

MPH
km/h
HI BEAM
SPEEDOMETER
HIGH BEAM INDICATOR LIGHT
ODOMETER

SPEEDOMETER	Indicates carrier speed in kilometers and miles per hour.
ODOMETER	Indicates total carrier distance traveled in kilometers.
HI BEAM INDICATOR LIGHT	Goes on when headlight high beams are on.

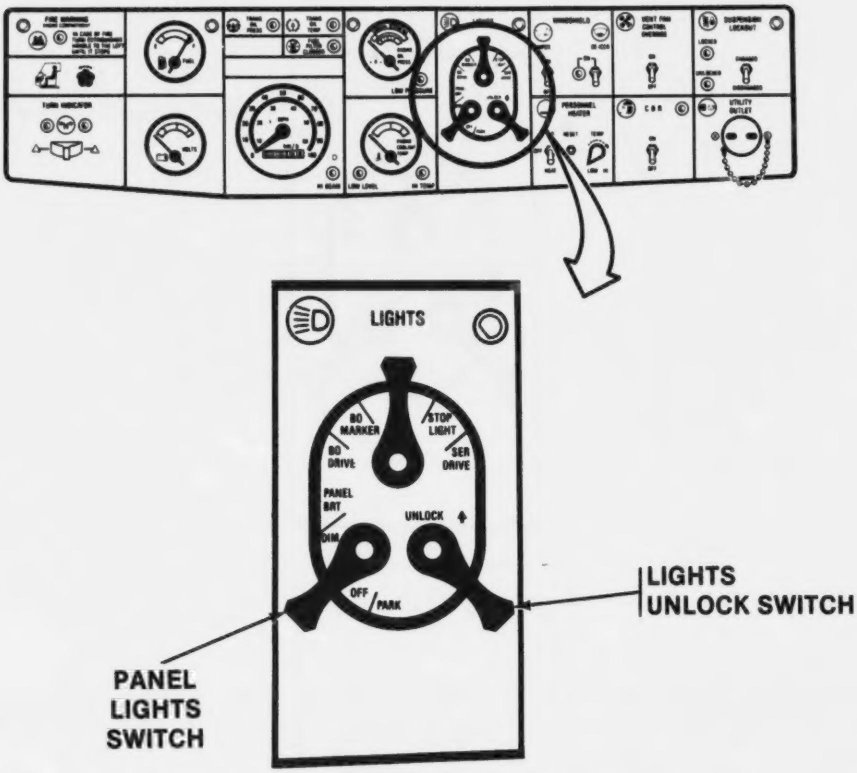

NORMAL OPERATING
IDLE
ENGINE OIL PRESS
LOW PRESSURE
ENGINE OIL PRESS GAGE
ENGINE OIL LOW PRESSURE WARNING LIGHT

ENGINE OIL PRESS GAGE	Indicates engine oil pressure as follows: Lower band — indicates low (red zone) and normal (green zone) oil pressure with engine at idle speed. Upper band — indicates low (red zone) and normal (green zone) oil pressure with engine at operating speed.
ENGINE OIL LOW PRESSURE WARNING LIGHT	Goes on when engine oil pressure is low.

DRIVER'S INSTRUMENT PANEL (cont)

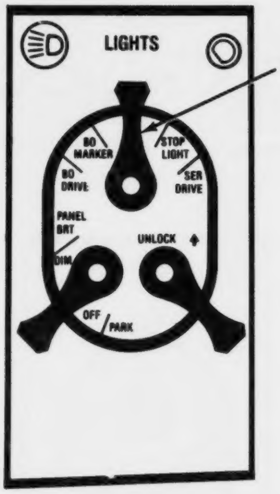

ENGINE COOLANT TEMP GAGE
ENGINE COOLANT TEMP
COOLANT LOW LEVEL WARNING LIGHT
LOW LEVEL
HI TEMP
COOLANT HI TEMP WARNING LIGHT

ENGINE COOLANT TEMP GAGE	Indicates temperature range of engine coolant as follows: Green zone — Indicates that engine is operating at normal temperatures. Yellow zone — Indicates that engine is operating at normal temperatures under fully-loaded conditions. Red zone — Indicates that engine is overheating.
COOLANT HI TEMP WARNING LIGHT	Goes on when engine coolant temperature is too hot.
COOLANT LOW LEVEL WARNING LIGHT	Goes on when engine coolant level is low.


LIGHTS
BO MARKER
STOP LIGHT
BO DRIVE
SER DRIVE
PANEL BRT
DIM
UNLOCK
OFF
PARK
LIGHTS UNLOCK SWITCH
PANEL LIGHTS SWITCH

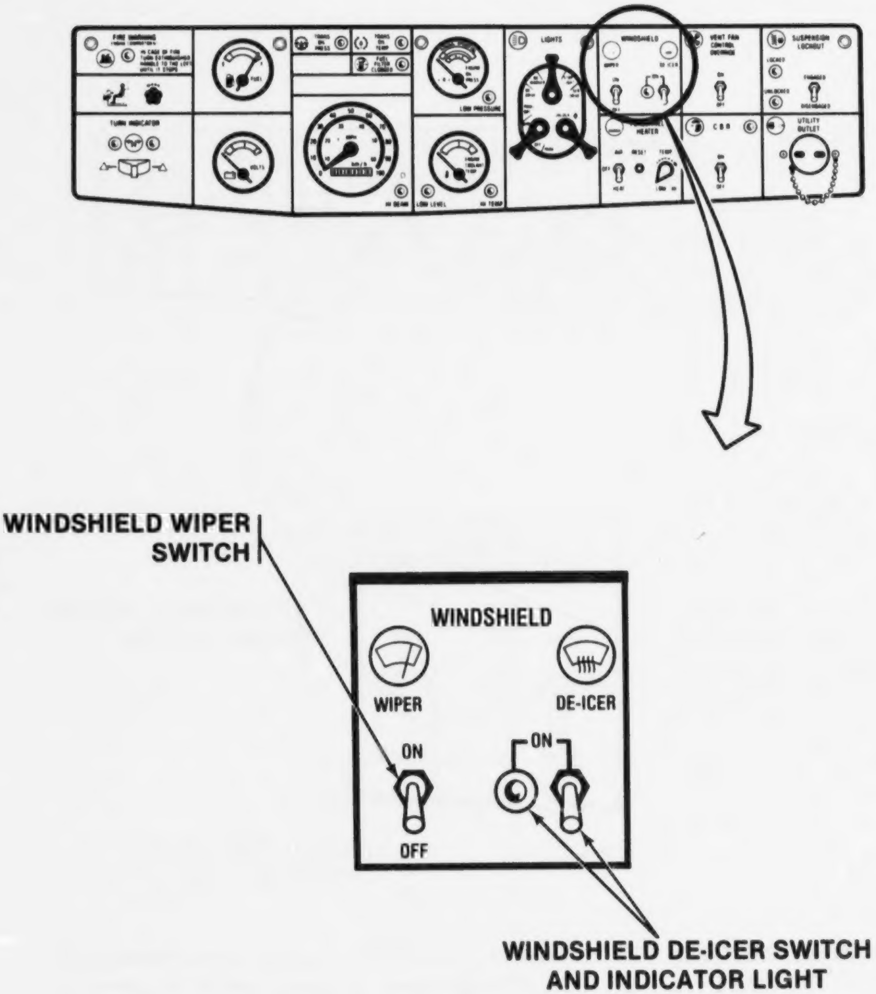
LIGHTS UNLOCK SWITCH	Spring-loaded, two-position lever. Must be held in UNLOCK position when setting driving lights switch to any position other than BO MARKER. Returns to locking position when released.
PANELS LIGHTS SWITCH	Four-position rotary switch controls panel lights as follows: PANEL BRT — Turns on panel lights to bright. DIM — Turns on panel lights to dim. OFF — Turns off panel lights system. PARK — Turns on taillights.

DRIVER'S INSTRUMENT PANEL (cont)


LIGHTS
BO MARKER
STOP LIGHT
BO DRIVE
SER DRIVE
PANEL BRT
DIM
UNLOCK
OFF
PARK

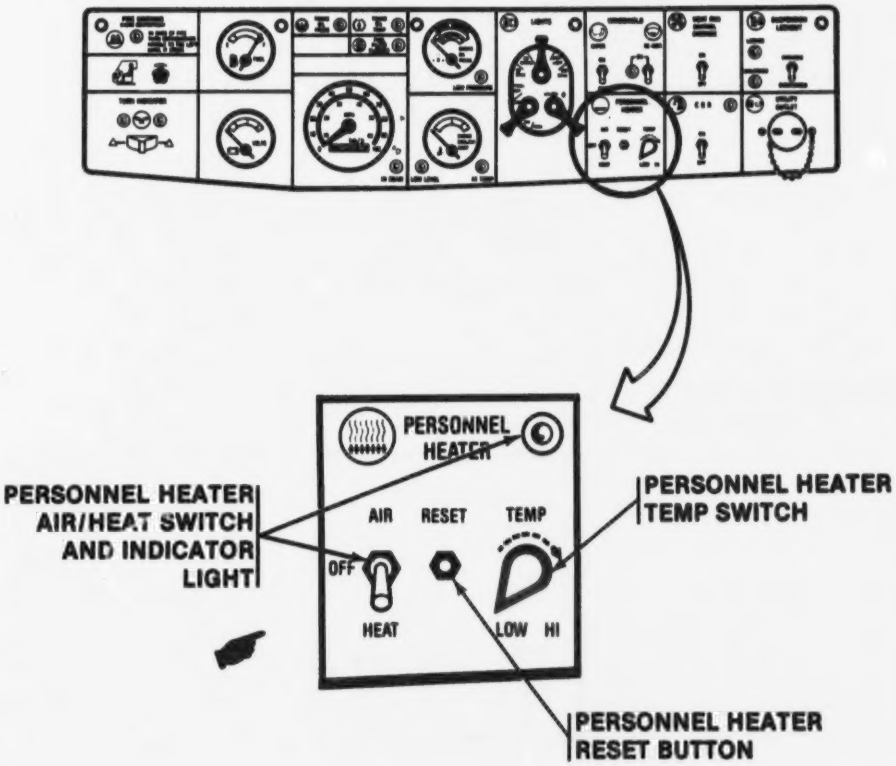
DRIVING LIGHTS SWITCH

DRIVING LIGHTS SWITCH	Five-position rotary switch controls outside carrier lights as follows: BO DRIVE — Turns on blackout driving light, outside front white blackout markers, and outside rear red blackout markers. BO MARKER — Turns on all blackout markers and activates white blackout stop lights. OFF — Turns off all exterior lights. STOP LIGHT — Allows stop lights to function during daytime operation without headlights. SER DRIVE — Turns on headlights and allows conventional stop lights to operate.

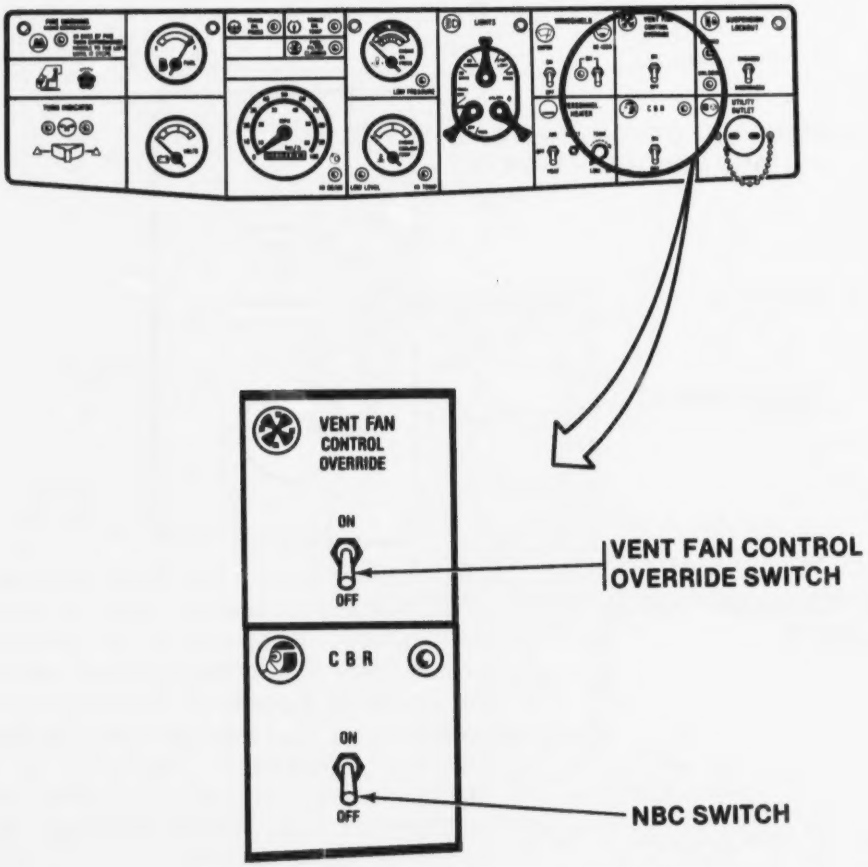

WINDSHIELD WIPER SWITCH
WINDSHIELD
WIPER
DE-ICER
ON
OFF
ON
WINDSHIELD DE-ICER SWITCH AND INDICATOR LIGHT

WINDSHIELD WIPER SWITCH	Turns windshield wipers on and off.
WINDSHIELD DE-ICER SWITCH AND INDICATOR LIGHT	Turns windshield de-icer on and off. Indicator light goes on when WINDSHIELD DE-ICER switch is on.

DRIVER'S INSTRUMENT PANEL (cont)

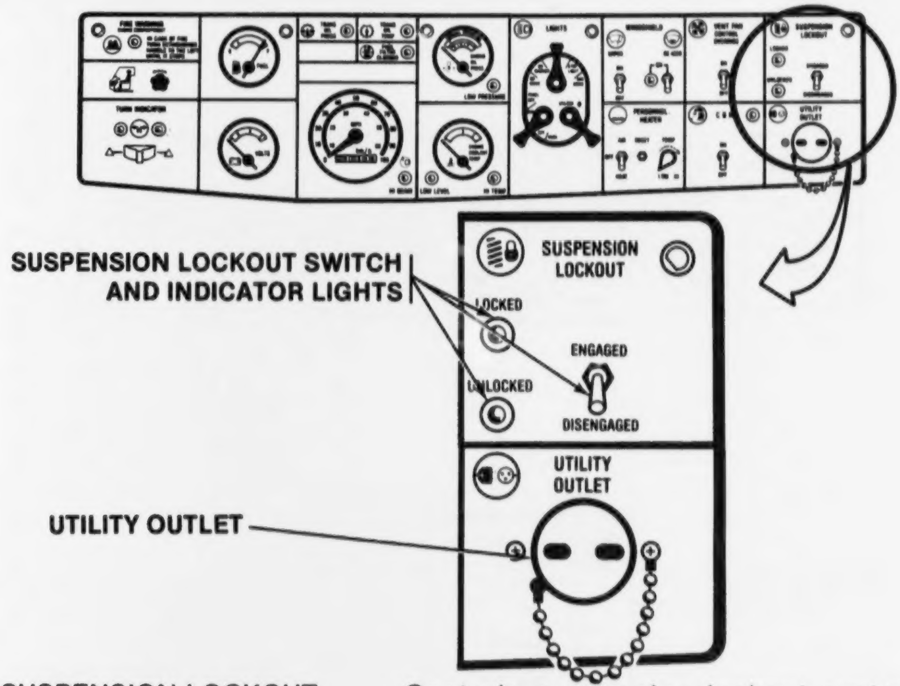

PERSONNEL HEATER
AIR RESET TEMP
OFF
HEAT
LOW HI
PERSONNEL HEATER AIR/HEAT SWITCH AND INDICATOR LIGHT
PERSONNEL HEATER TEMP SWITCH
PERSONNEL HEATER RESET BUTTON

PERSONNEL HEATER AIR/HEAT SWITCH AND INDICATOR LIGHT	Controls operation of personnel heater. Indicator light goes on when heater is turned on and goes off when all fuel has burned and heater has cooled down.
PERSONNEL HEATER TEMP SWITCH	Controls personnel heater output.
PERSONNEL HEATER RESET BUTTON	Resets personnel heater.


VENT FAN
CONTROL
OVERRIDE
ON
OFF
C B R
ON
OFF
VENT FAN CONTROL
OVERRIDE SWITCH
NBC SWITCH

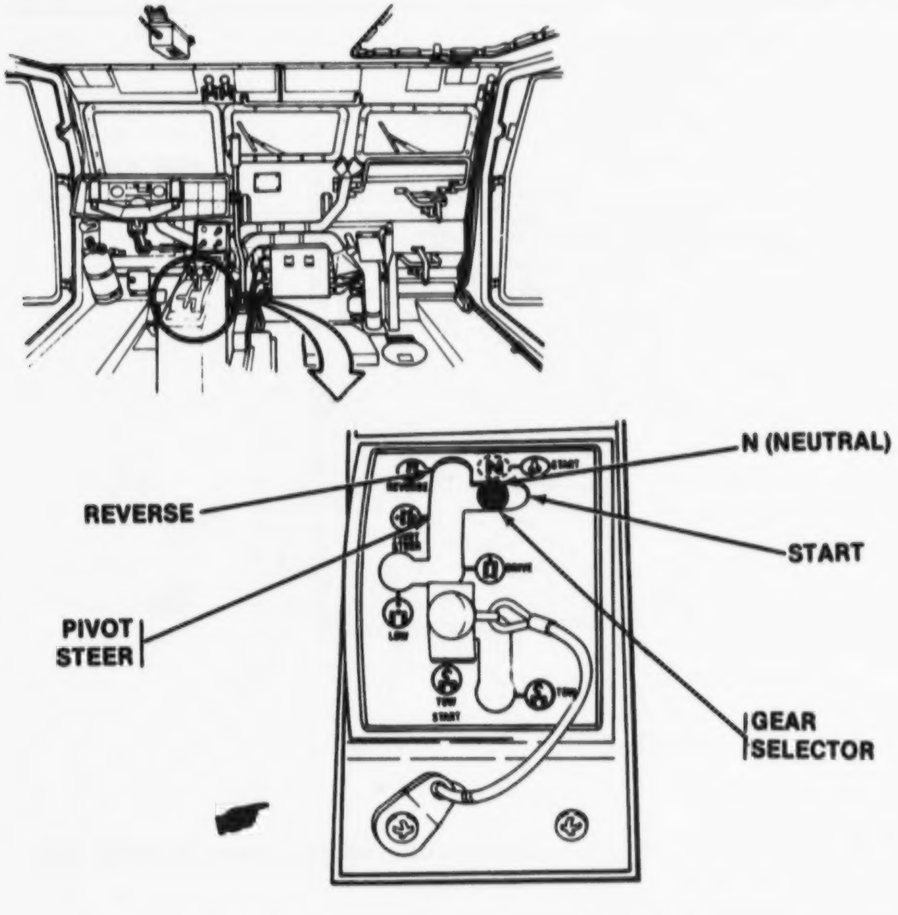
VENT FAN CONTROL OVERRIDE SWITCH	Overrides FAN CONTROL switch.
NBC SWITCH	Turns NBC filter system on and off.

DRIVER'S INSTRUMENT PANEL (cont)


SUSPENSION LOCKOUT SWITCH AND INDICATOR LIGHTS
UTILITY OUTLET
SUSPENSION LOCKOUT
LOCKED
ENGAGED
UNLOCKED
DISENGAGED
UTILITY OUTLET

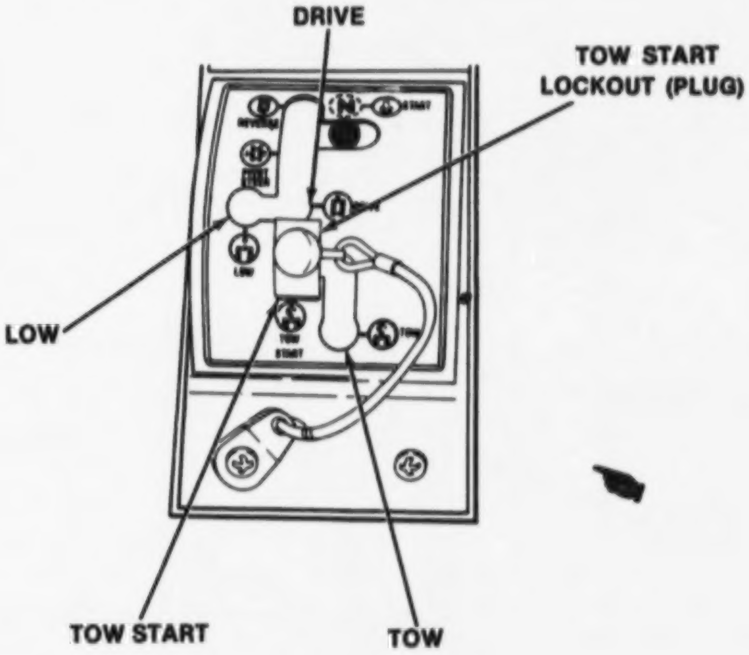
SUSPENSION LOCKOUT SWITCH AND INDICATOR LIGHTS	Controls suspension lockout system. Activates suspension lockout system and allows suspension to be locked when SUSPENSION LOCKOUT switch is in ENGAGED position. Deactivates suspension lockout system when SUSPENSION LOCKOUT switch is in DISENGAGED position. SUSPENSION LOCKOUT UNLOCKED indicator light goes on when SUSPENSION LOCKOUT switch is in DISENGAGED position and suspension is unlocked. SUSPENSION LOCKOUT LOCKED indicator light goes on when SUSPENSION LOCKOUT switch is in ENGAGED position and suspension is locked.
UTILITY OUTLET	Provides 28 vdc for general purpose use when engine is running.

GEAR SELECTOR PANEL


N (NEUTRAL)
REVERSE
START
PIVOT STEER
GEAR SELECTOR

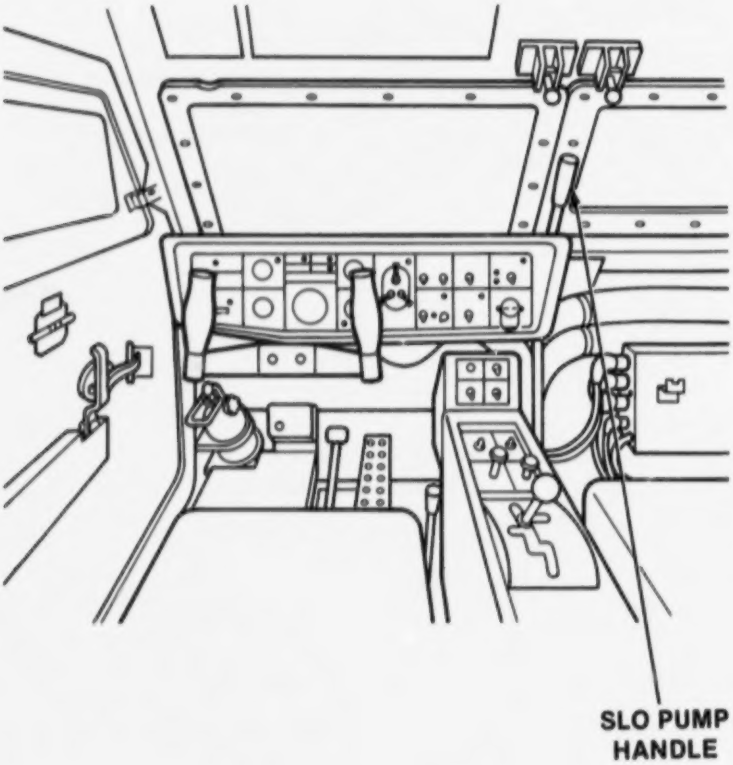
GEAR SELECTOR	Selects driving gear of transmission.
REVERSE	Used to drive carrier to the rear.
N (NEUTRAL)	Disengages transmission from engine.
START	Engages engine starter.
PIVOT STEER	Used to turn carrier on its own center.

GEAR SELECTOR PANEL (cont)


DRIVE
TOW START
LOCKOUT (PLUG)
LOW
TOW START
TOW

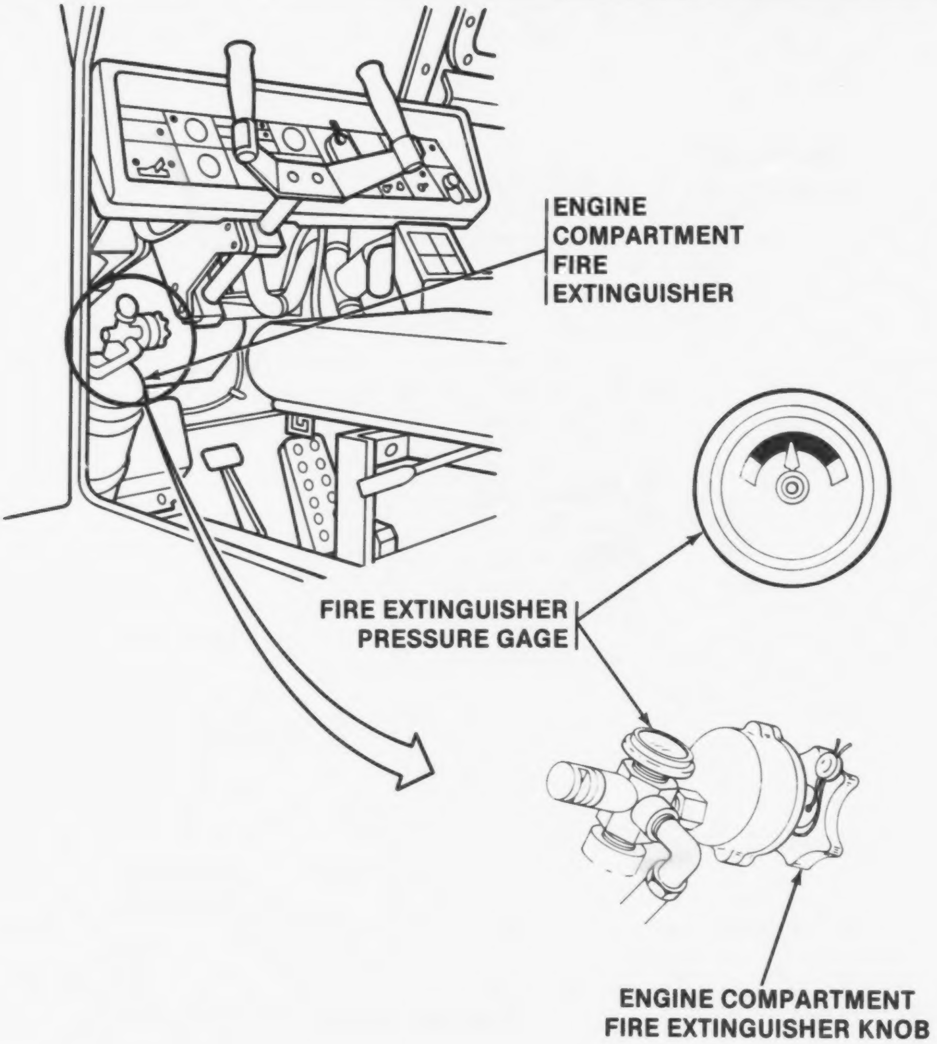
DRIVE	Used to drive carrier forward in normal operating range.
LOW	Used to hold carrier in low driving range.
TOW START	Used to start engine while being towed by another carrier.
TOW START LOCKOUT (PLUG)	Used to prevent gear selector from being moved from DRIVE to TOW START when carrier is being driven.
TOW	Used when carrier is being towed.

HYDRAULIC PUMP HANDLE

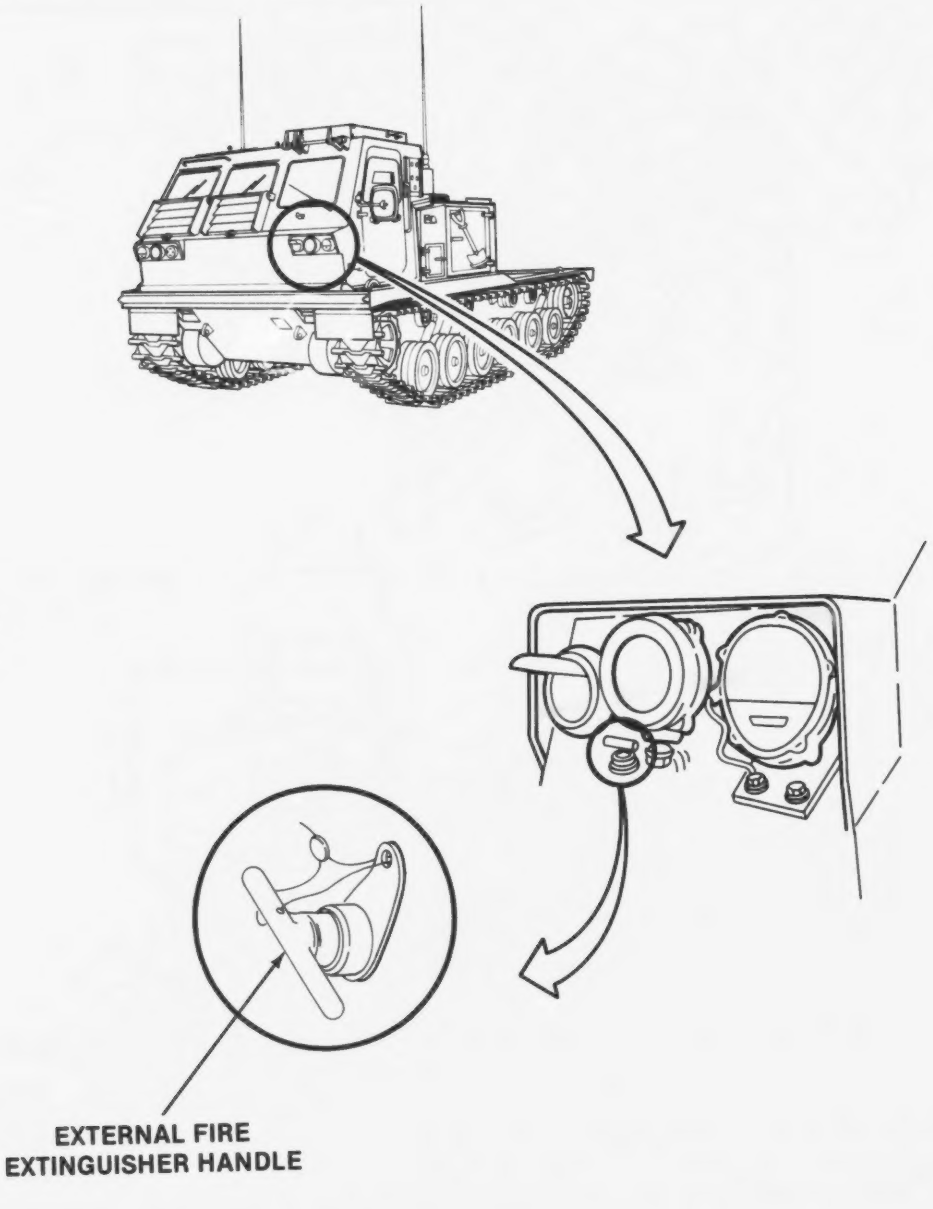

SLO PUMP HANDLE

SLO PUMP HANDLE	Engages suspension lockout.

ENGINE COMPARTMENT FIRE SUPPRESSION SYSTEM

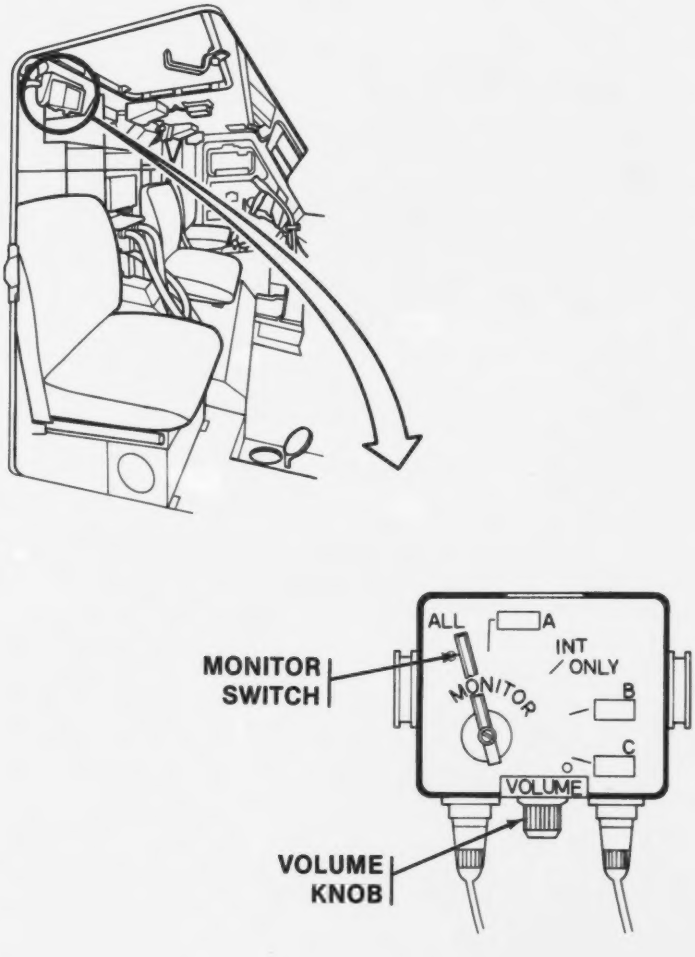

ENGINE COMPARTMENT FIRE EXTINGUISHER
FIRE EXTINGUISHER PRESSURE GAGE
ENGINE COMPARTMENT FIRE EXTINGUISHER KNOB

ENGINE COMPARTMENT FIRE EXTINGUISHER KNOB	Discharges engine compartment fire extinguisher manually from inside carrier.
FIRE EXTINGUISHER PRESSURE GAGE	Indicates if fire extinguisher is fully charged.


EXTERNAL FIRE
EXTINGUISHER HANDLE

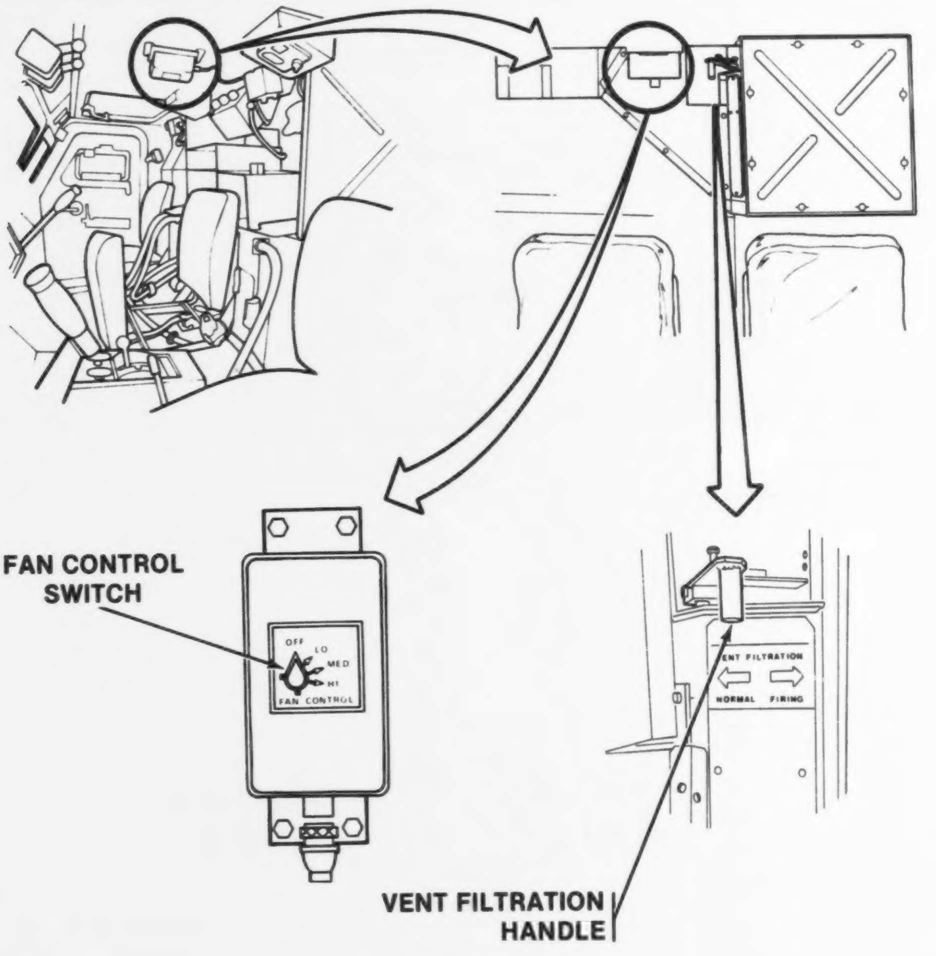
EXTERNAL FIRE EXTINGUISHER HANDLE	Discharges fire suppression system manually from outside of carrier.

INTERCOM CONTROL BOX


ALL
A
INT
ONLY
MONITOR
B
C
VOLUME
MONITOR SWITCH
VOLUME KNOB

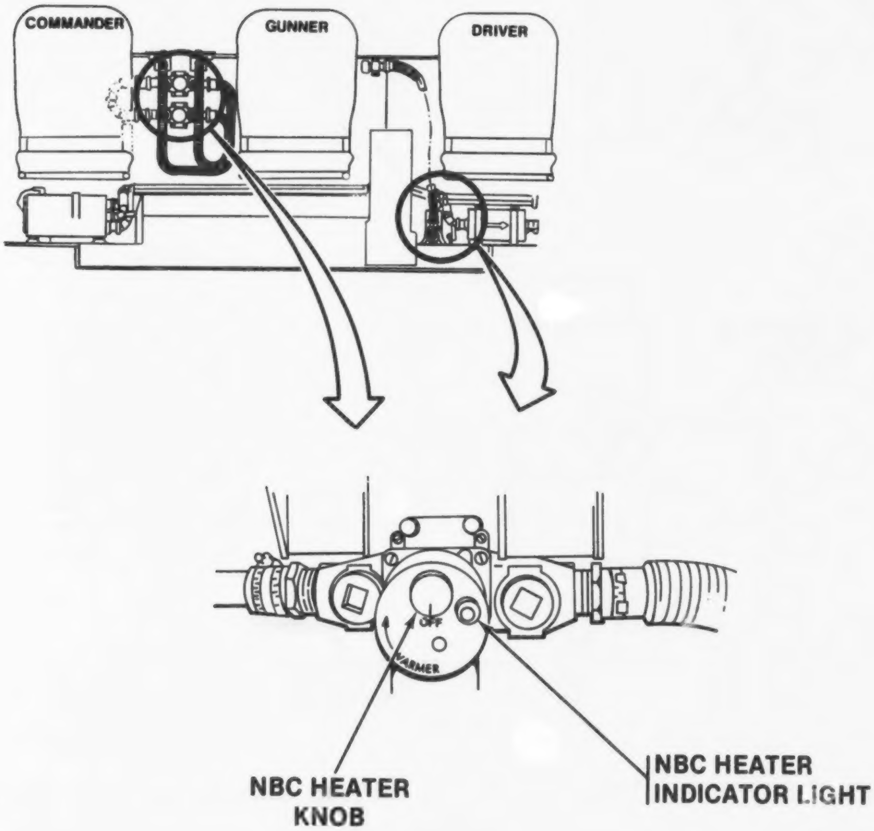
MONITOR SWITCH	Allows selection of intercom channels and radio channels.
VOLUME KNOB	Controls intercom volume.

VENTILATION SYSTEM


FAN CONTROL SWITCH
OFF
LO
MED
HI
FAN CONTROL
ENT FILTRATION
NORMAL
FIRING
VENT FILTRATION HANDLE

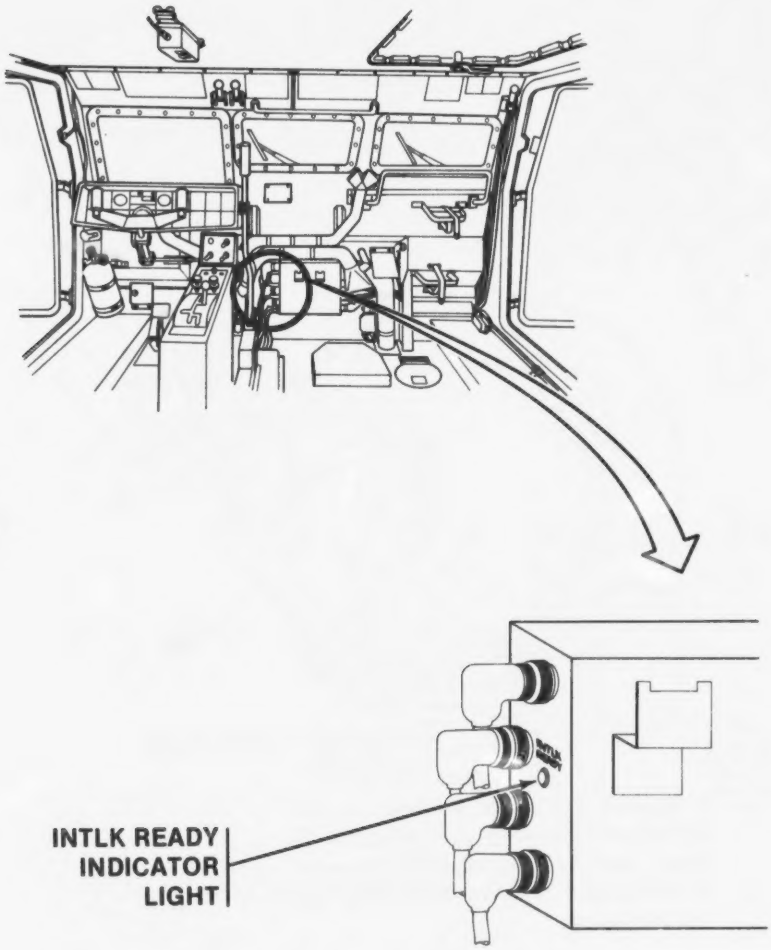
FAN CONTROL SWITCH	Turns on and adjusts ventilation fan speed.
VENT FILTRATION HANDLE	Opens and closes to control flow of external air into cab compartment. Allows normal cab ventilation when in NORMAL position. Limits exhaust entering cab during launch operations when in FIRING position.

NBC SYSTEM


COMMANDER
GUNNER
DRIVER
OFF
WARMER
NBC HEATER KNOB
NBC HEATER INDICATOR LIGHT

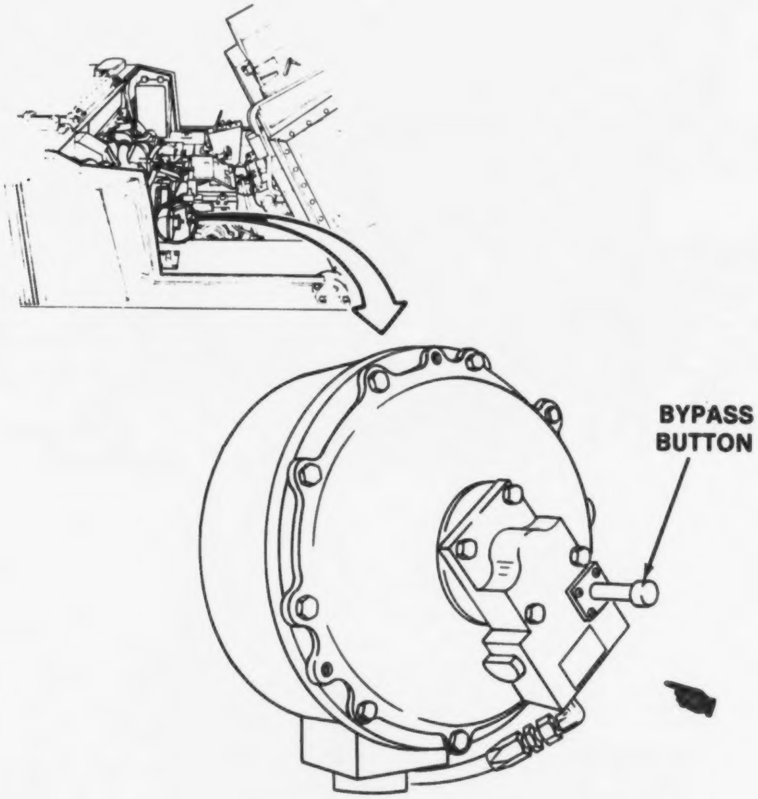
NBC HEATER KNOB AND INDICATOR LIGHT	Turns on and off NBC heater and controls heat output. Indicator light comes on when NBC heater is turned on.

LAUNCHER SAFETY SYSTEM


INTLK READY INDICATOR LIGHT
INTLK READY

INTLK READY INDICATOR LIGHT	Indicates when commander's hatch cover, cab doors, and vent fan firing door are closed so missile fumes will not enter cab.

BYPASS BUTTON

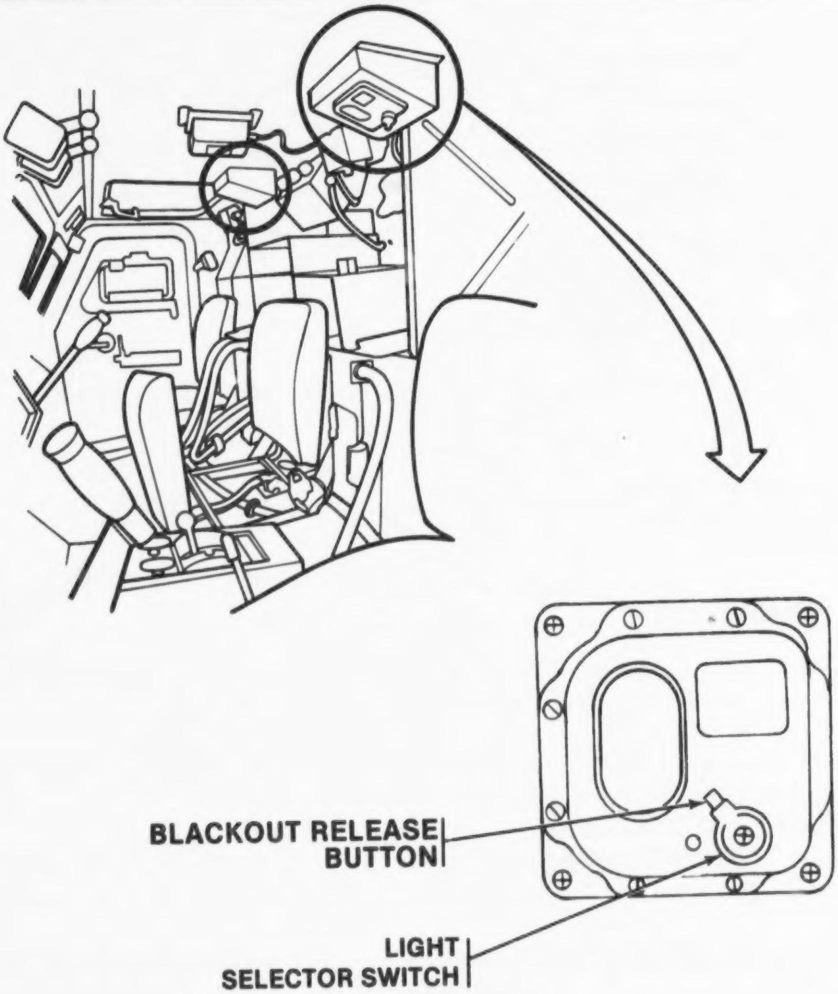


CAUTION

If bypass button is pushed in and locked under normal operating conditions, possible damage could occur to vanaxial fan drive assembly and transmission.

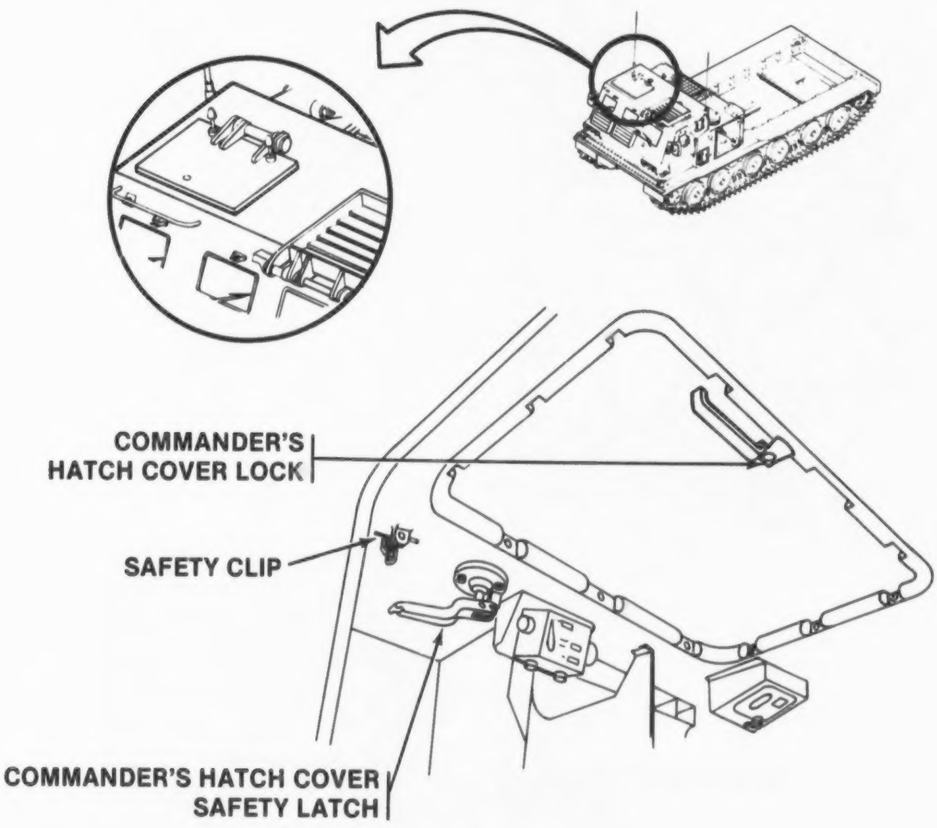
BYPASS BUTTON	Used to provide extra cooling when pushed into bypass position. Bypass button should only be used if an overheat condition exists and troubleshooting requires its use. Bypass button should be released when engine has cooled. If pushed in, will lower top speed of carrier.

CAB COMPARTMENT DOME LIGHTS


BLACKOUT RELEASE BUTTON
LIGHT SELECTOR SWITCH

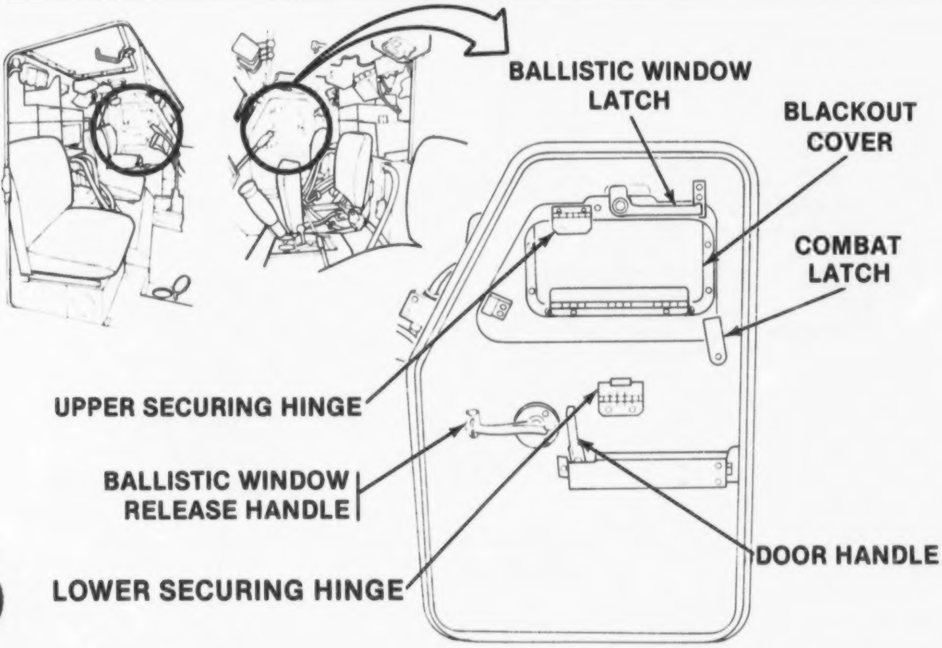
BLACKOUT RELEASE BUTTON	Releases light selector switch from blackout position.
LIGHT SELECTOR SWITCH	Selects blackout or white light.

COMMANDER'S HATCH COVER


COMMANDER'S HATCH COVER LOCK
SAFETY CLIP
COMMANDER'S HATCH COVER SAFETY LATCH

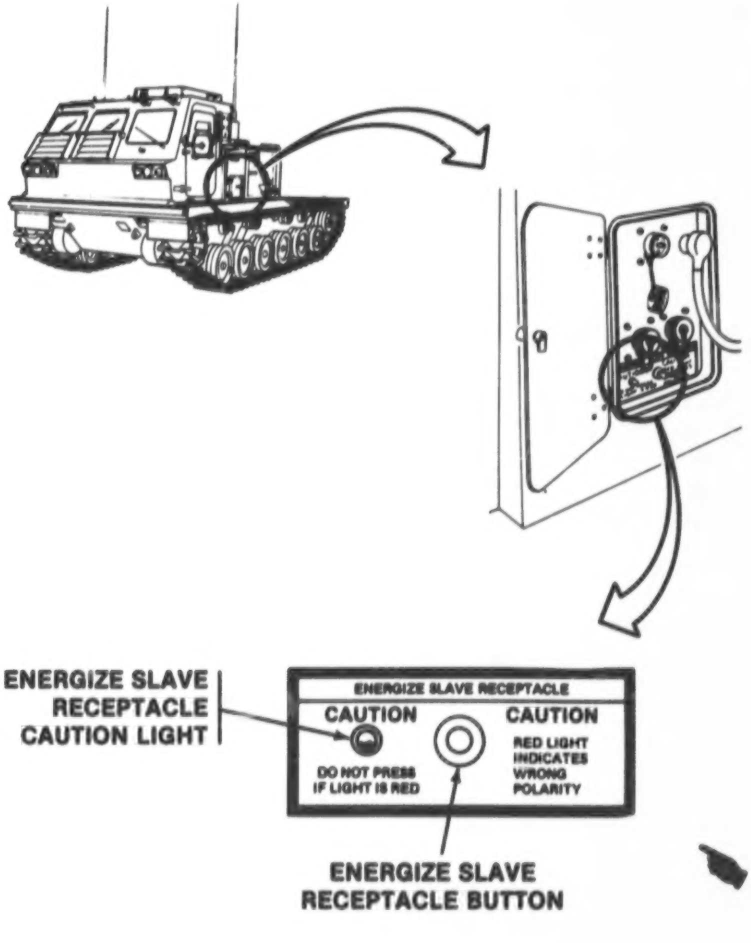
COMMANDER'S HATCH COVER LOCK	Locks and unlocks commander's hatch cover from inside carrier. Commander's hatch cover opens to POP-UP position when unlocked.
COMMANDER'S HATCH COVER SAFETY LATCH	Controls opening, positioning, and closing of commander's hatch cover from inside carrier.
SAFETY CLIP	Secures commander's hatch cover safety latch in place.

DRIVER'S AND COMMANDER'S PERSONNEL DOORS


BALLISTIC WINDOW LATCH
BLACKOUT COVER
COMBAT LATCH
UPPER SECURING HINGE
BALLISTIC WINDOW RELEASE HANDLE
DOOR HANDLE
LOWER SECURING HINGE

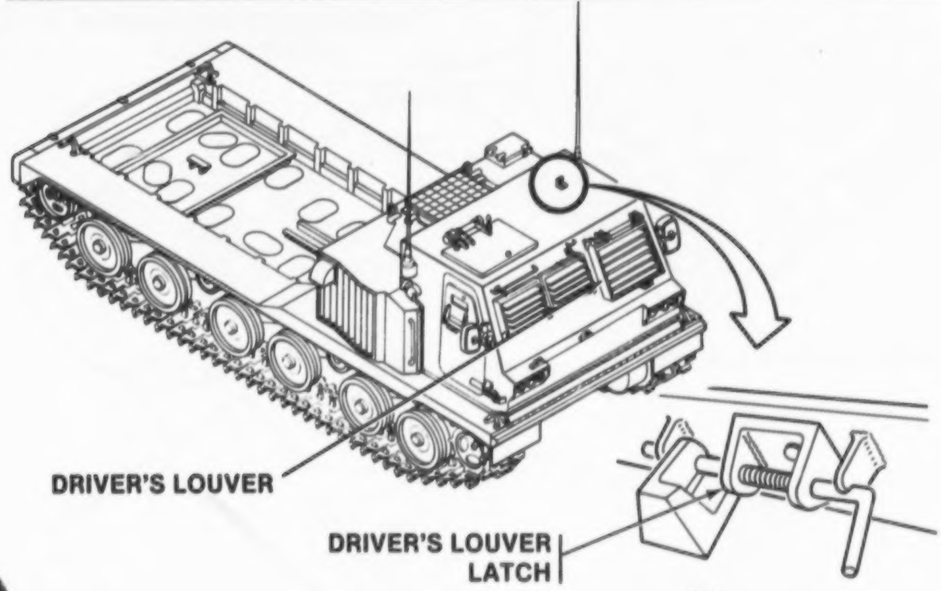
DOOR HANDLE	Opens and closes driver's and commander's personnel doors.
COMBAT LATCH	Secures personnel door from inside cab to prevent entry from outside carrier.
BALLISTIC WINDOW RELEASE HANDLE	Releases ballistic window from open position.
BALLISTIC WINDOW LATCH	Secures ballistic window in closed position.
BLACKOUT COVER	Keeps interior light from being seen outside cab during night operations.
UPPER SECURING HINGE	Secures blackout cover in raised position.
LOWER SECURING HINGE	Secures blackout cover in lowered position.

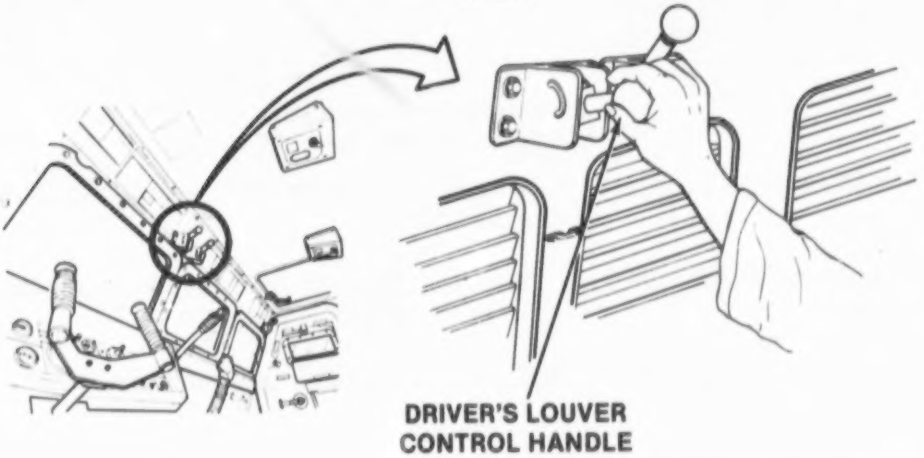
ELECTRICAL EQUIPMENT BOX


ENERGIZE SLAVE RECEPTACLE CAUTION LIGHT
ENERGIZE SLAVE RECEPTACLE
CAUTION
DO NOT PRESS IF LIGHT IS RED
CAUTION
RED LIGHT INDICATES WRONG POLARITY
ENERGIZE SLAVE RECEPTACLE BUTTON

ENERGIZE SLAVE RECEPTACLE BUTTON	Energizes slave receptacle to output electrical power.
ENERGIZE SLAVE RECEPTACLE CAUTION LIGHT	Red light indicates wrong polarity in slave receptacle. Green light indicates correct polarity.

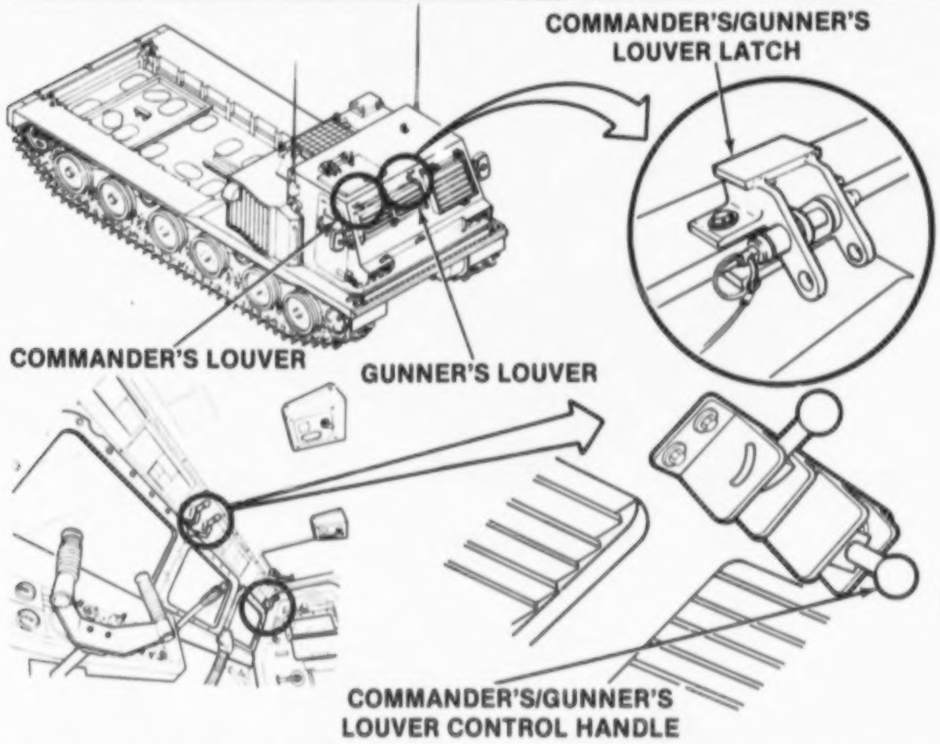
DRIVER'S LOUVER


DRIVER'S LOUVER
DRIVER'S LOUVER LATCH


DRIVER'S LOUVER CONTROL HANDLE

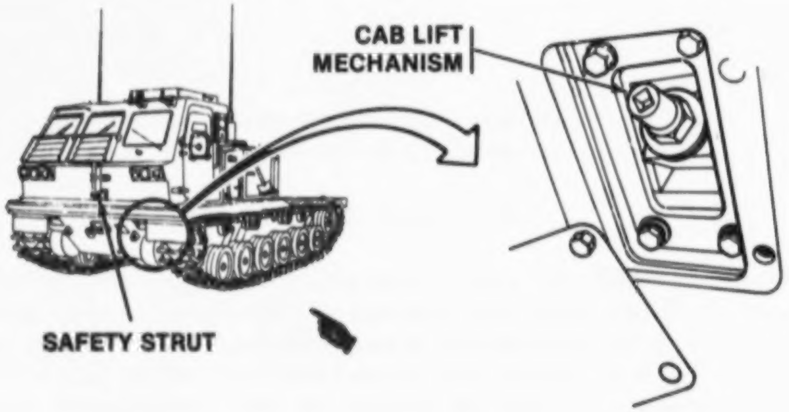
DRIVER'S LOUVER	Protects driver during launch operations.
DRIVER'S LOUVER LATCH	Secures driver's louver in stowed or battle position.
DRIVER'S LOUVER CONTROL HANDLE	Opens and closes driver's louver.

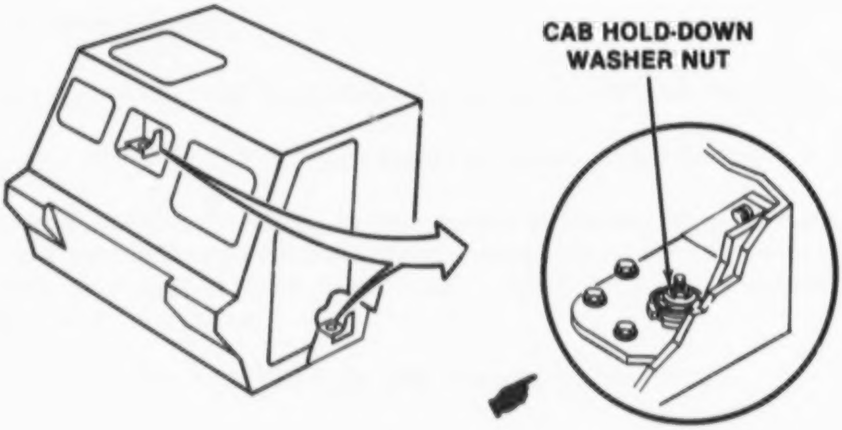
COMMANDER'S/GUNNER'S LOUVER


COMMANDER'S/GUNNER'S LOUVER LATCH
COMMANDER'S LOUVER
GUNNER'S LOUVER
COMMANDER'S/GUNNER'S LOUVER CONTROL HANDLE

COMMANDER'S LOUVER	Protects commander during launch operations.
COMMANDER'S LOUVER LATCH	Secures commander's louver in stowed or battle position.
COMMANDER'S LOUVER CONTROL HANDLE	Opens and closes commander's louver.
GUNNER'S LOUVER	Protects gunner during launch operations.
GUNNER'S LOUVER LATCH	Secures gunner's louver in stowed or battle position.
GUNNER'S LOUVER CONTROL HANDLE	Opens and closes gunner's louver.

CAB LIFT SYSTEM


CAB LIFT MECHANISM
SAFETY STRUT


CAB HOLD-DOWN WASHER NUT

CAB LIFT MECHANISM	Allows cab to be raised and lowered.
CAB HOLD-DOWN WASHER NUT	Secures cab in lowered position.
SAFETY STRUT	Secures cab in raised position.

Section II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

SCOPE

This section details preventive maintenance checks and services (PMCS) required for the Multiple Launch Rocket System (MLRS) Carrier.

MAINTENANCE FORMS AND RECORDS

Every mission begins and ends with paperwork. There isn't much of it, but you have to keep it up. The forms and records you fill out have many uses. They are a permanent record of the services, repairs, and changes made to your carrier. They are reports to organizational maintenance and to your commander. They are checklists that tell you what was wrong with the carrier after its last use. They also tell you whether those faults have been repaired. For information on forms and records, see DA PAM 738-750.

PMCS PROCEDURES

1. Obey all WARNINGS and CAUTIONS when you do your PMCS.

2. Do your BEFORE (B) PMCS just before you operate your carrier.

3. Do your DURING (D) PMCS during operation. Monitor your carrier and its systems while you are actually operating your carrier. Perform a (D) check of a system only when actual operation of that system is required for a mission.

4. Do your AFTER (A) PMCS right after operating your carrier.

5. Do your WEEKLY (W) PMCS weekly.

6. Do your MONTHLY (M) PMCS monthly.

7. If something does not work, troubleshoot it using the Troubleshooting Procedures on page 3-3 of this manual. Notify your supervisor.

8. Always do your PMCS in the same order so it gets to be a habit. With practice, you will spot anything that is wrong.

PMCS PROCEDURES (cont)

9. If you find anything wrong which will make your carrier NOT READY/AVAILABLE, notify organizational maintenance right away. If you find something wrong, but you can still complete your mission, write it up. Use the DA FORM 2404 (Equipment Inspection and Maintenance Worksheet). Use item numbers from the PMCS chart for the "TM Number" column on the form.

10. When you do your PMCS, take along the tools you will need to make all the checks. You will always need wiping rags.

11. Keep your carrier clean. Dirt, grease, oil, and debris only get in the way, and may cover up a serious problem. Clean your carrier as you work and as needed.

WARNING

Solvent fumes can burn and could poison you. Read warning on front page of this manual.

12. Use cleaning solvent (Item 5, App D) on metal surfaces. Use soap (Item 10, App D) and water when you clean rubber or plastic surfaces. Clean outside of windows with soap and water. Use lint free cloth (Item 4, App D) on inside of windows.

13. Bolts, nuts, and screws: Check for looseness and missing, bent, or broken parts. If you find a loose one, tighten it. If you can't tighten it, notify organizational maintenance. Look for chipped paint, bare metal, or rust around bolt heads.

14. Welds: Look for loose or chipped paint, rust, cracks, or gaps where parts are welded together. If you find a bad weld, notify organizational maintenance.

15. Electrical wires and connectors: Look for cracked or broken insulation, bare wires, and loose or broken connectors. Tighten loose connectors. Make sure wires are in good shape. If you find cracked or broken insulation, bare wires, or broken connectors, notify organizational maintenance.

16. Straps: Look for rubber hold down straps that are cracked, broken, or have hardened. Look for webbing stowage straps that are frayed, worn, or have missing metal ends. If you find bad straps, notify unit maintenance.

17. Hoses and fluid lines: Look for wear, damage, and leaks. Make sure clamps and fitting are tight. Wet spots show leaks. A stain around a fitting or connector can also mean there is a leak. If a leak comes from a loose fitting or connector, tighten each fitting or connector. If something is broken or worn out, notify organizational maintenance.

18. You need to know how fluid leaks affect your carrier. Definitions of the types and classes of leaks are given below. You need to know them to determine the condition of your carrier. Learn them. REMEMBER: WHEN IN DOUBT, NOTIFY YOUR SUPERVISOR!

CLASS I	Seepage of fluid is not great enough to form drops, but is shown by wetness or discoloration.
CLASS II	Leakage of fluid is great enough to form drops, but drops do not drip from the item being checked or inspected.
CLASS III	Leakage of fluid is great enough to form drops that fall from the item being checked or inspected.

NOTE

You are allowed to operate equipment with minor leaks (Class I or II). How much fluid each item or system being checked or inspected can hold must be considered. When in doubt, notify your supervisor. When operating equipment with Class I or II leaks, continue to check fluid levels as required in your PMCS. Report Class III leaks to your supervisor, or notify unit maintenance for corrective action right away.

19. Perform all lubrication in accordance with LO 9-1450-646-12.

NOTE

Perform WEEKLY PMCS as well as BEFORE PMCS if:

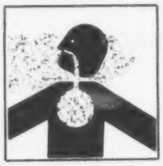
(1) You are the assigned operator and have not operated the equipment since the last weekly PMCS, or

(2) You are operating the equipment for the first time.

BEFORE (B) OPERATION CHECKS

You may need to clean the inside of your carrier in order to perform the required checks. If you clean the inside of your carrier, be sure to observe the following:

WARNING



Solvent fumes can burn and could poison you. Read warning on front page of this manual.

Benzene (benzol), paint thinner, gasoline, and diesel fuel oil can burn and could poison you. Do not use benzene (benzol), paint thinner, gasoline, or diesel fuel oil for cleaning.

CAUTION

Steam, water, or air under pressure can damage sighting and fire control equipment gears and bearings. Do not clean inside of carrier with steam, water, or air under pressure.

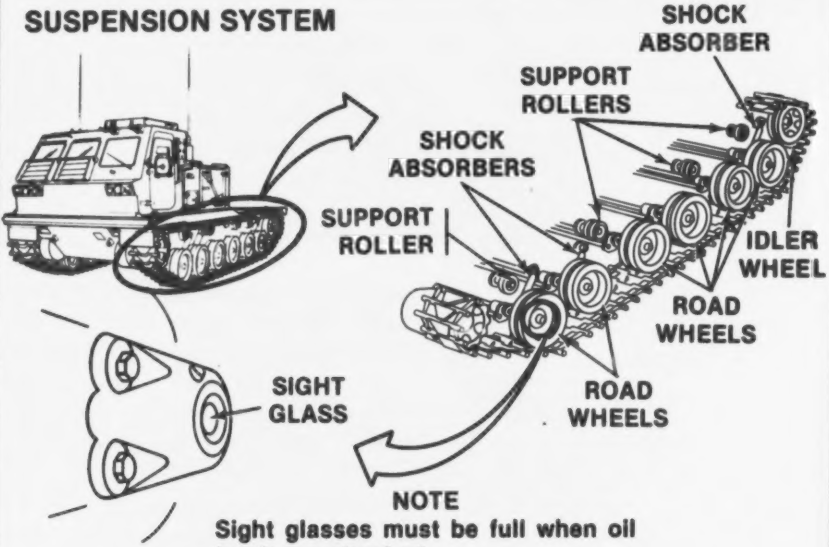
Water entering engine exhaust system can damage engine. Do not allow water to enter engine exhaust system.

Petroleum products will damage rubber that is not resistant to petroleum. Do not get petroleum products on rubber parts.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES

BEFORE (B) OPERATION CHECKS

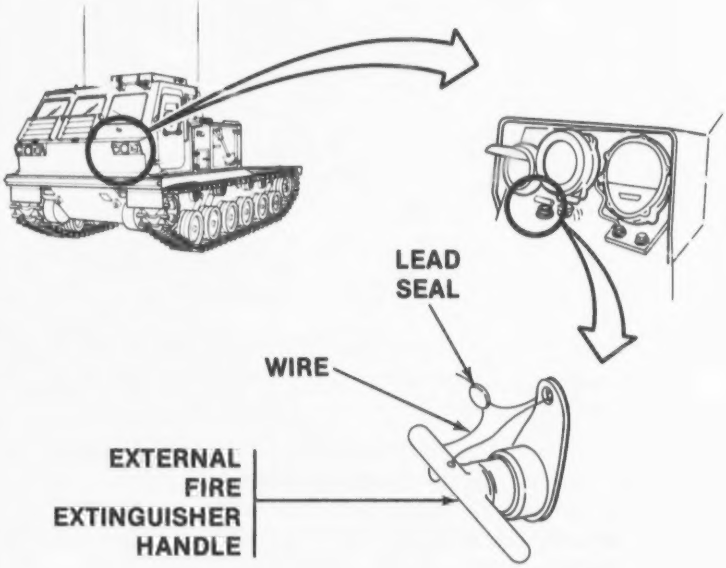
ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	SUSPENSION SYSTEM	


SHOCK ABSORBER
SUPPORT ROLLERS
SHOCK ABSORBERS
SUPPORT ROLLER
IDLER WHEEL
ROAD WHEELS
SIGHT GLASS
ROAD WHEELS

NOTE

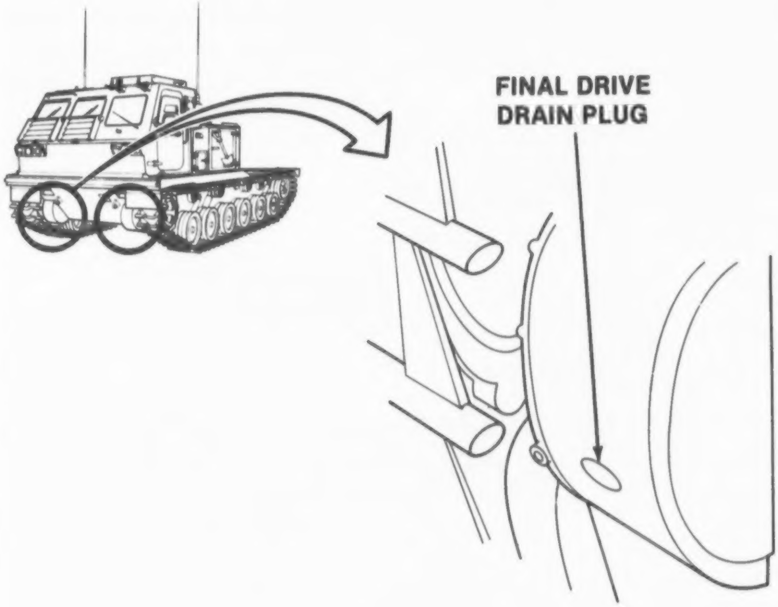
Sight glasses must be full when oil levels are checked.

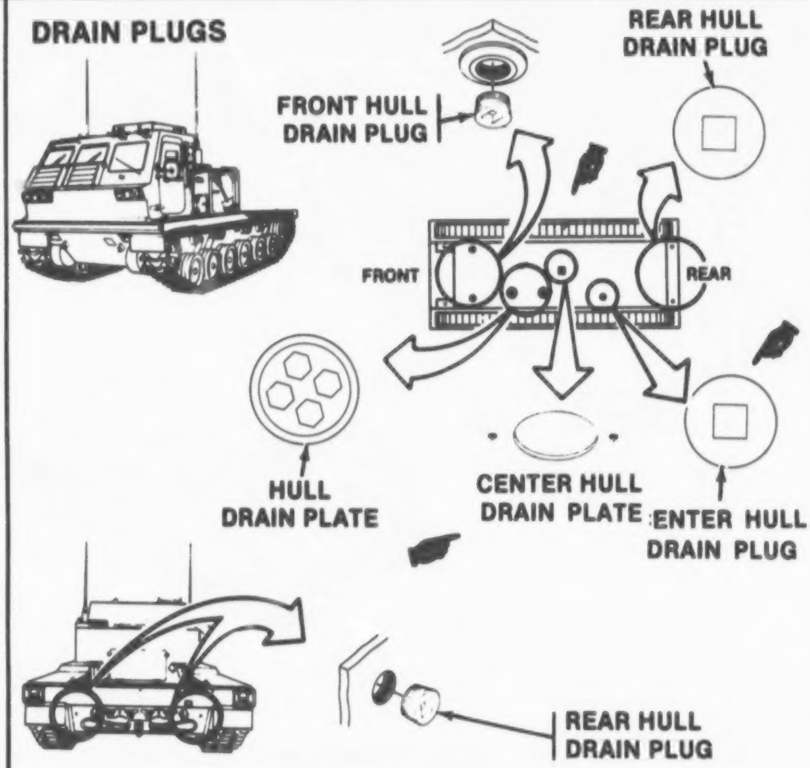
ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
1	Check road wheels, idler wheels, and support roller oil levels through sight glasses.	Oil level cannot be seen through sight glass.
2	Check road wheels, idler wheels, and support roller sight glasses for breaks.	Sight glass is broken.
3	Check road wheels, idler wheels, support rollers, and shock absorbers for signs of oil leaks.	Any class III oil leak is found at road wheels, idler wheels, shock absorbers, or support rollers.

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	CARRIER EXTERIOR	
4	Check outside of carrier for signs of fuel or oil leaks.	Any Class III oil leak is found or any fuel leak is found.
	FIRE EXTINGUISHERS  LEAD SEAL WIRE EXTERNAL FIRE EXTINGUISHER HANDLE	
5	Check wires and lead seals on external fire extinguisher handle	Wire or lead seal on external fire extinguisher handle is missing or broken.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES

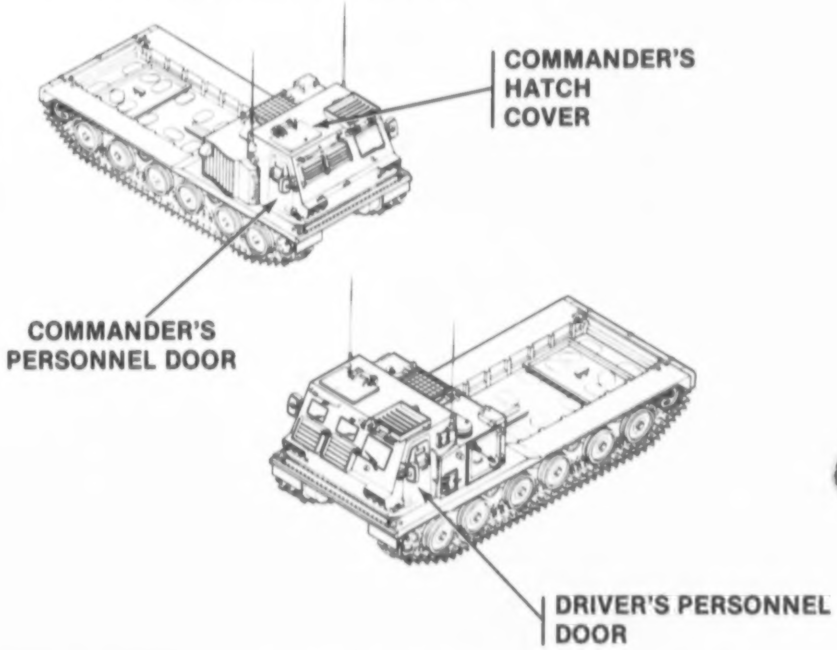
BEFORE (B) OPERATION CHECKS (cont)

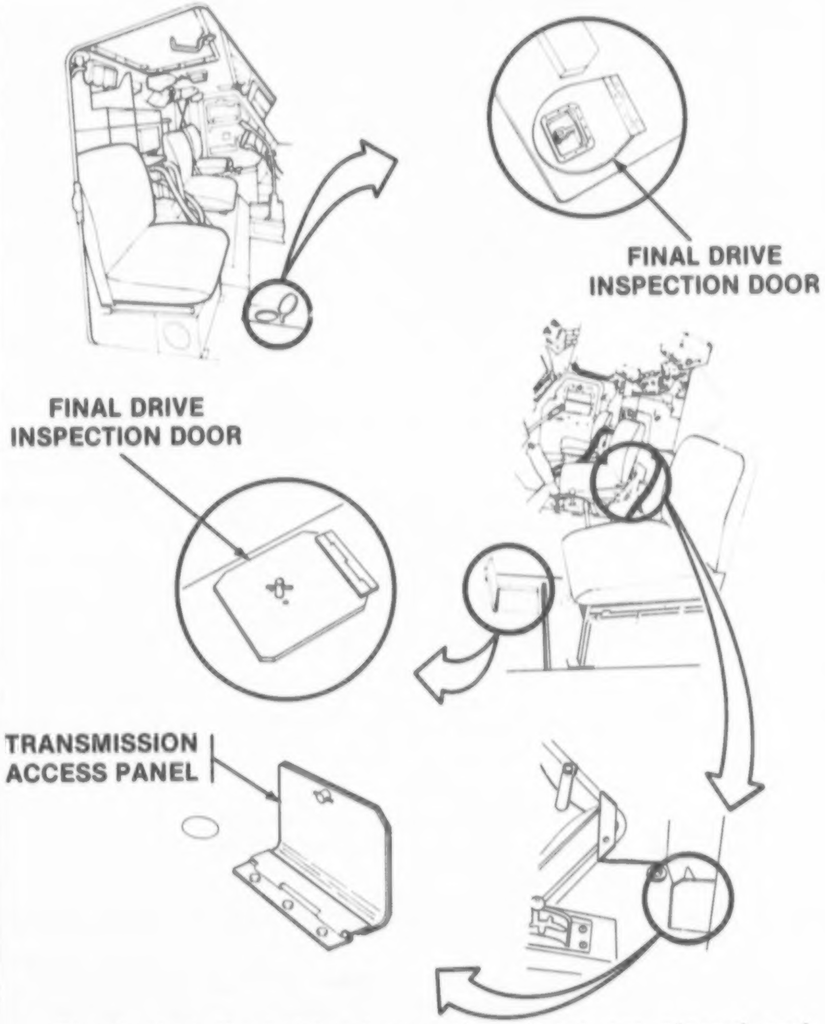
ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	FINAL DRIVE DRAIN PLUGS 	
	NOTE **Only carriers after carrier No. 14 have final drive drain plugs.**	
6	Check that right and left final drive plugs are closed.	

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	DRAIN PLUGS  REAR HULL DRAIN PLUG FRONT HULL DRAIN PLUG FRONT REAR HULL DRAIN PLATE CENTER HULL DRAIN PLATE CENTER HULL DRAIN PLUG REAR HULL DRAIN PLUG **NOTE** **Front hull drain plugs should be removed when carrier is parked for an extended time period in wet weather. Front hull drain plugs should be installed whenever carrier is operated.**	
7	Check that front hull drain plugs are installed.	
8	Check that hull drain plates are installed and secure.	
9	Check that center hull drain plug is removed and stowed.	
10	Check that rear hull drain plugs are removed and stowed.	

PREVENTIVE MAINTENANCE CHECKS AND SERVICES

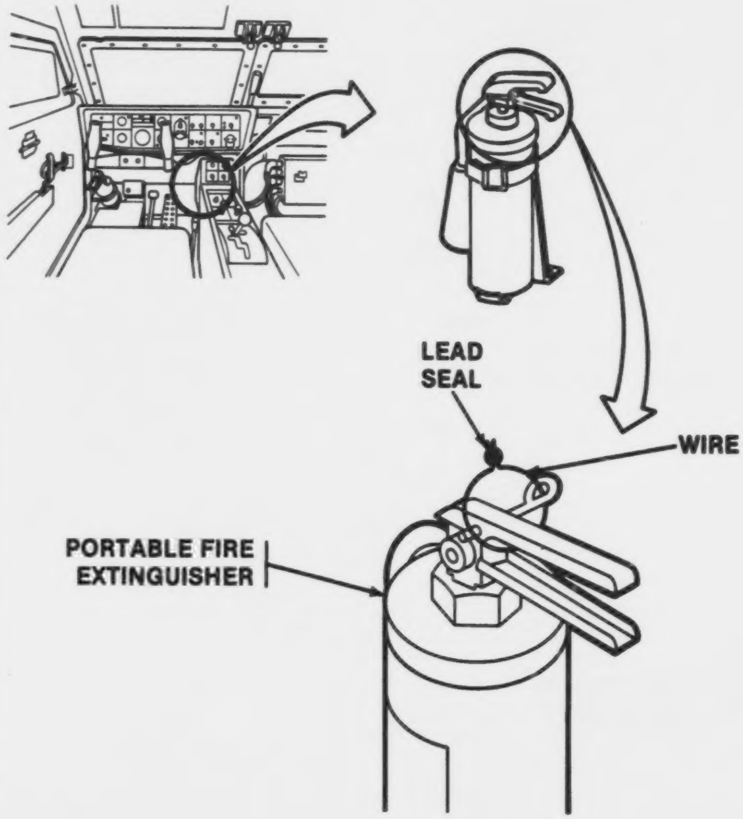
BEFORE (B) OPERATION CHECKS (cont)

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	DOORS, COVERS, AND PANELS  COMMANDER'S HATCH COVER COMMANDER'S PERSONNEL DOOR DRIVER'S PERSONNEL DOOR Open and close driver's and commander's personnel doors. See task: OPEN/CLOSE PERSONNEL DOORS AND DOOR ASSEMBLIES, page 2-96.	
11	Check that driver's and commander's personnel doors open and close freely. Open and close commander's hatch cover. See task: OPEN/CLOSE COMMANDER'S HATCH COVER, page 2-103.	
12	Check that commander's hatch cover opens and closes freely, and locks in OPEN, POPPED-UP, and CLOSED positions.	

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	 FINAL DRIVE INSPECTION DOOR FINAL DRIVE INSPECTION DOOR TRANSMISSION ACCESS PANEL	
13	Check that final drive inspection doors are closed and locked.	
14	Check that transmission access panel is closed and secure.	

PREVENTIVE MAINTENANCE CHECKS AND SERVICES
BEFORE (B) OPERATION CHECKS (cont)

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	FIRE EXTINGUISHERS	



15	Check wire and lead seal on portable fire extinguisher.	Wire and lead seal on portable fire extinguisher is missing or broken. Fire extinguisher is discharged. Portable fire extinguisher is missing.

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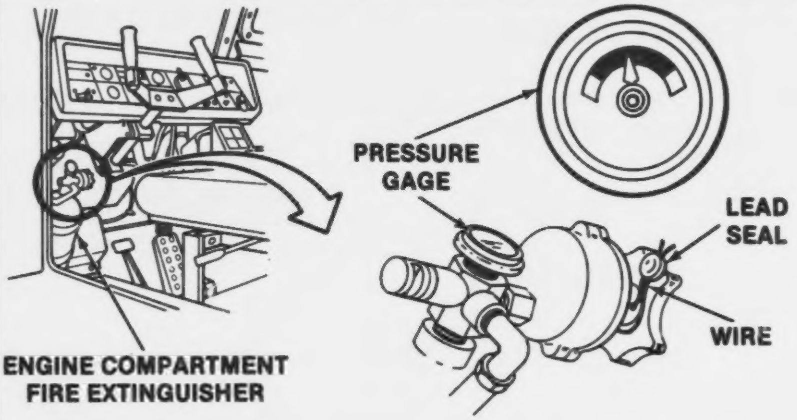
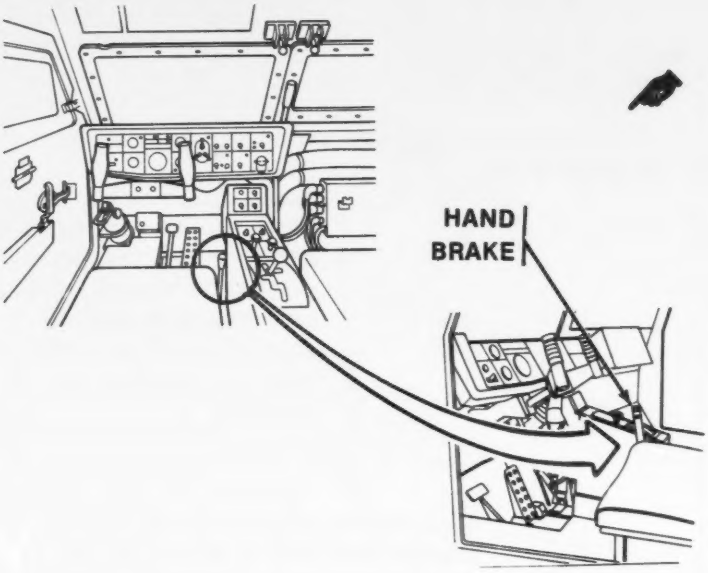
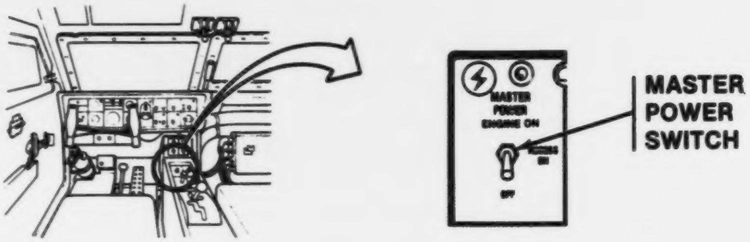
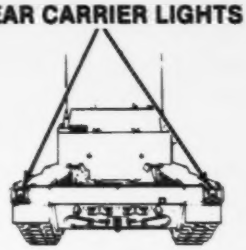
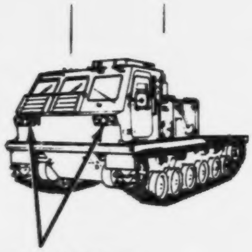
ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	 PRESSURE GAGE LEAD SEAL WIRE ENGINE COMPARTMENT FIRE EXTINGUISHER	
16	Check wire or lead seal on engine compartment fire extinguisher.	Wire or lead seal on engine compartment fire extinguisher is missing or broken. Fire extinguisher is discharged. Engine compartment fire extinguisher is missing.
	NOTE **Some engine compartment fire extinguishers may have an elbow to make pressure gage easier to read. Procedure for checking pressure gage is the same.**	
17	Check that pressure gage on engine compartment fire extinguisher is in green or yellow zone.	Pressure gage on engine compartment fire extinguisher reads in red zone.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES

BEFORE (B) OPERATION CHECKS (cont)

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	DRIVER'S SEAT	
18	Check driver's seat adjustment. See task: OPERATE SEATS, page 2-112.	Driver's seat will not adjust.
	HAND BRAKE	
		
18.1	Check hand brake.	Hand brake is defective, inoperable, or out of adjustment.

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	CARRIER EXTERIOR LIGHTS  MASTER POWER ENGINE ON ACCESS ON OFF MASTER POWER SWITCH  REAR CARRIER LIGHTS  FRONT CARRIER LIGHTS Station one helper at front of carrier and another helper at rear of carrier. Move MASTER POWER switch to ACCESS ON. Turn on carrier lights. See task: OPERATE CARRIER LIGHTS, page 2-184.	
18.2	Check that all carrier exterior lights operate correctly, are not damaged, and do not contain moisture. Turn off carrier lights. See task: OPERATE CARRIER LIGHTS, page 2-184. Move MASTER POWER switch to OFF.	

DURING (D) OPERATION CHECKS

You may need to clean the inside of your carrier in order to perform the required checks. If you clean the inside of your carrier, be sure to observe the following:

WARNING

Solvent fumes can burn and could poison you. Read warning on front page of this manual.

Benzene (benzol), paint thinner, gasoline, and diesel fuel oil can burn and could poison you. Do not use benzene (benzol), paint thinner, gasoline, or diesel fuel oil for cleaning.

CAUTION

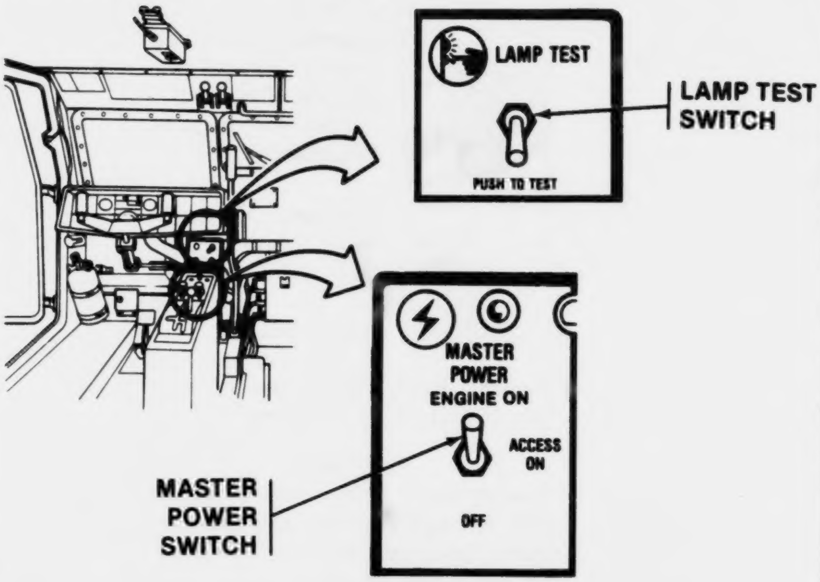
Steam, water, or air under pressure can damage sighting and fire control equipment gears and bearings. Do not clean inside of carrier with steam, water, or air under pressure.

Water entering engine exhaust system can damage engine. Do not allow water to enter engine exhaust system.

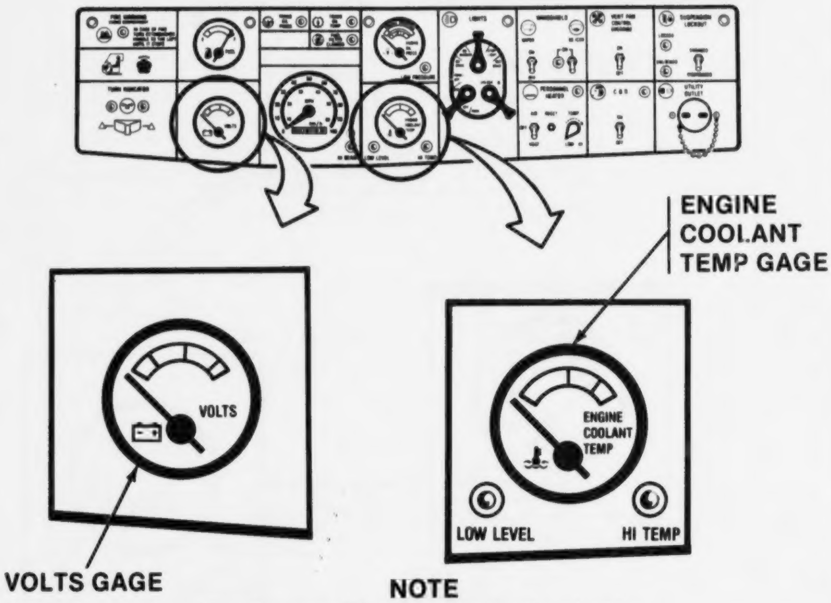
Petroleum products will damage rubber that is not resistant to petroleum. Do not get petroleum products on rubber parts.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES
DURING (D) OPERATION CHECKS

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	DRIVER'S INSTRUMENT PANEL	

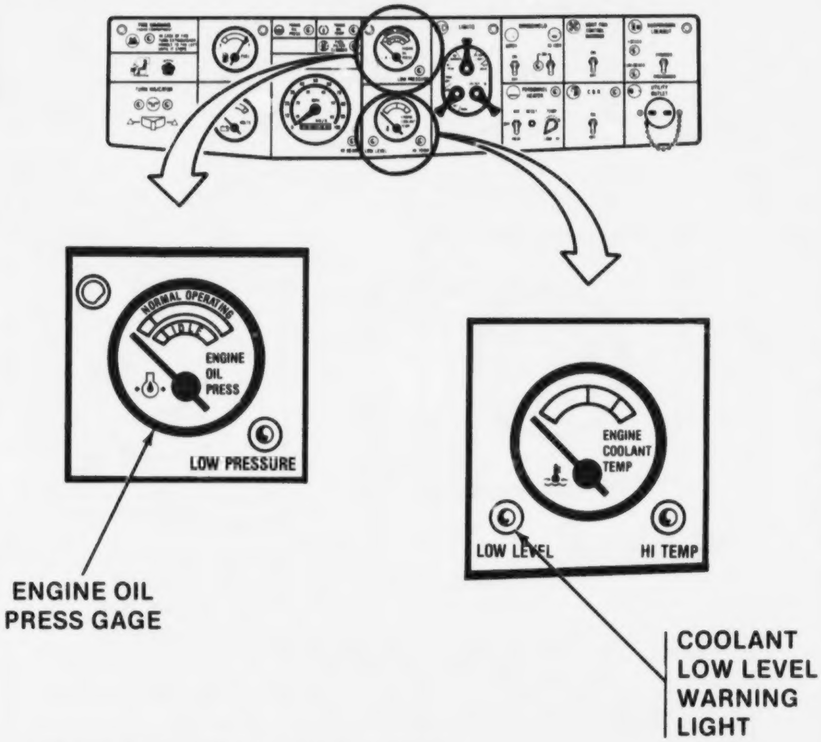

LAMP TEST
PUSH TO TEST
LAMP TEST SWITCH
MASTER POWER ENGINE ON
ACCESS ON
OFF
MASTER POWER SWITCH

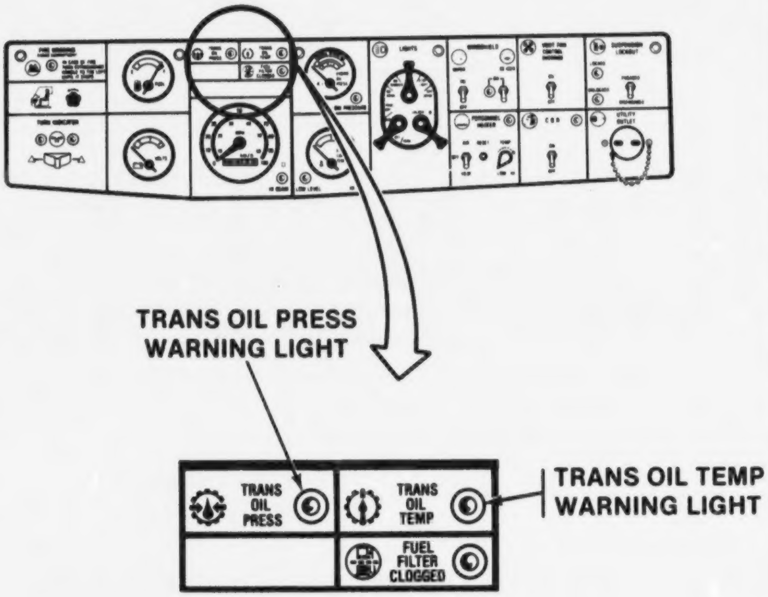
ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	Turn MASTER POWER switch to ENGINE ON. Press and hold LAMP TEST button.	
19	Check all instrument panel lights and that warning tone sounds.	ENGINE OIL LOW PRESSURE, TRANS OIL TEMP or FIRE WARNING lights do not light. Warning tone does not sound.

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	 ENGINE COOLANT TEMP GAGE VOLTS ENGINE COOLANT TEMP LOW LEVEL HI TEMP VOLTS GAGE	
	NOTE **Engine must be running to do checks 20 thru 25. Driver's panel gages and lights should be monitored while driving the carrier.**	
	Start engine. See page 2-125.	
20	Check VOLTS gage.	VOLTS gage pointer is in either left or right red zone.
21	Check ENGINE COOLANT TEMP gage.	ENGINE COOLANT TEMP gage pointer is in red zone.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES

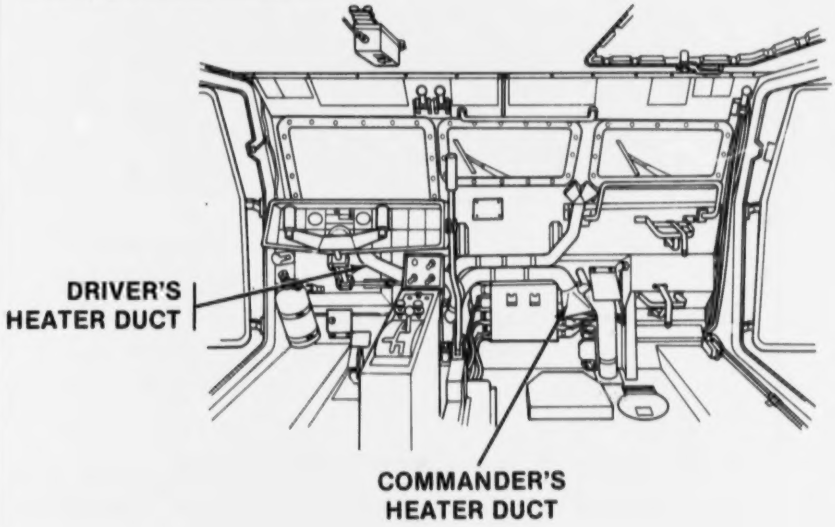
DURING (D) OPERATION CHECKS (cont)

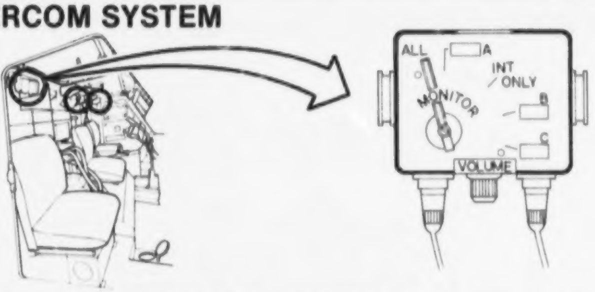
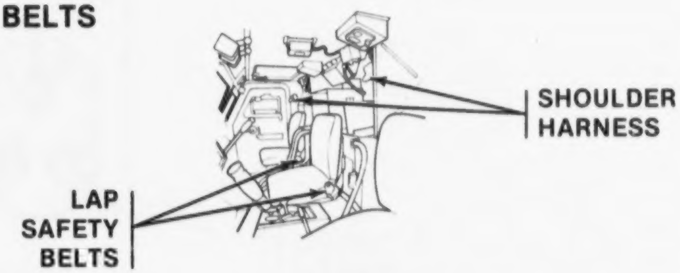
ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	DRIVER'S INSTRUMENT PANEL (cont)	
	 NORMAL OPERATING IDLE ENGINE OIL PRESS LOW PRESSURE ENGINE COOLANT TEMP LOW LEVEL HI TEMP ENGINE OIL PRESS GAGE COOLANT LOW LEVEL WARNING LIGHT	
22	Check ENGINE OIL PRESS gage.	ENGINE OIL PRESS gage pointer is in red zone.
23	Check COOLANT LOW LEVEL warning light.	COOLANT LOW LEVEL warning light is on.

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	 TRANS OIL PRESS WARNING LIGHT TRANS OIL TEMP WARNING LIGHT TRANS OIL PRESS TRANS OIL TEMP FUEL FILTER CLOGGED	
24	Check TRANS OIL PRESS warning light.	TRANS OIL PRESS warning light is on.
25	Check TRANS OIL TEMP warning light.	TRANS OIL TEMP warning light is on.

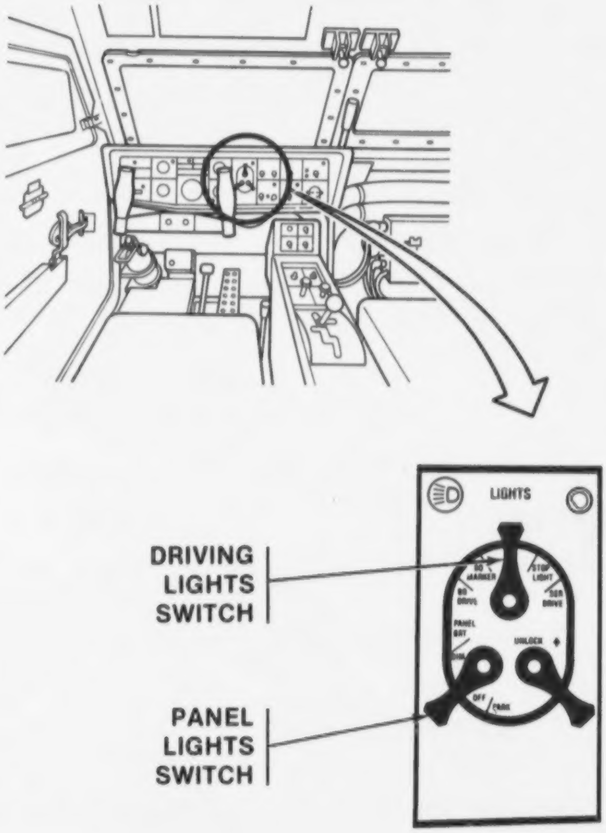
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

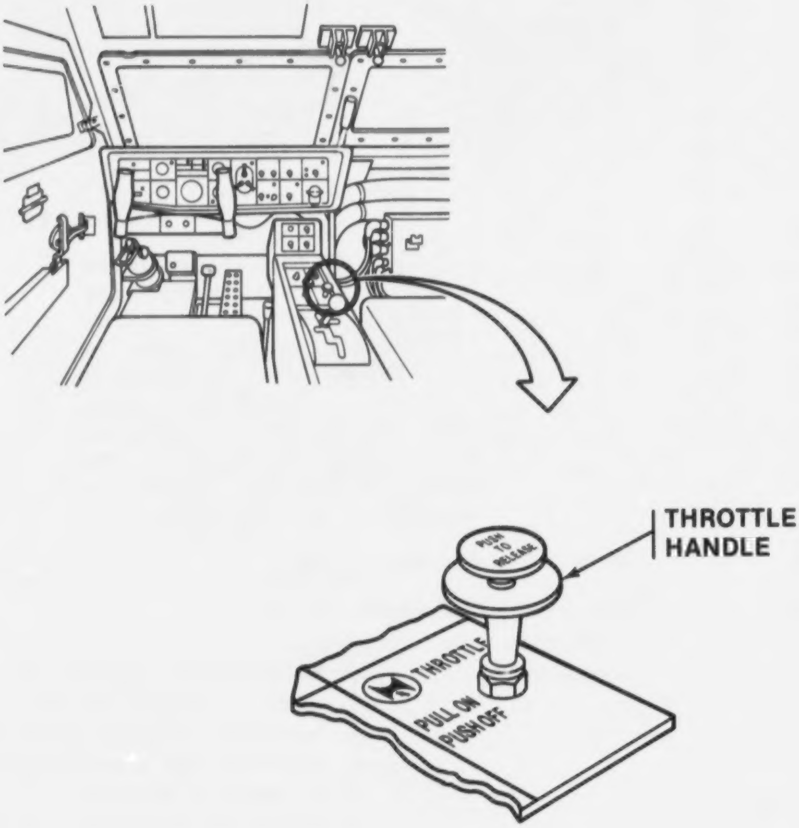
DURING (D) OPERATION CHECKS (cont)

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	PERSONNEL HEATER	
		
26	OPERATE PERSONNEL HEATER/DEFOGGER. See page 2-178. Check driver's and commander's heater ducts for steady heat output.	
27	**WARNING** **Exhaust from engine and heater can poison you. Do not breathe exhaust gases. See warning on front page of this manual.** Check cab for smoke or strong diesel fumes. Shut down personnel heater. See task OPERATE PERSONNEL HEATER/DEFOGGER, page 2-178.	Smoke or strong diesel fumes are present in cab.

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
28	**INTERCOM SYSTEM**  ALL A INT ONLY MONITOR B C VOLUME OPERATE INTERCOM SYSTEM. See page 2-123. Check intercom. Make communication check between commander, gunner, and driver.	Intercom does not work between commander, gunner, or driver.
29	**SEAT BELTS**  SHOULDER HARNESS LAP SAFETY BELTS Check that lap safety belts and shoulder harnesses adjust and release easily. **WARNING** **Soldiers can be injured riding in carrier seats without locking pins or seat belts. Do not use any seat with missing locking pin or missing or inoperative seat belts.**	

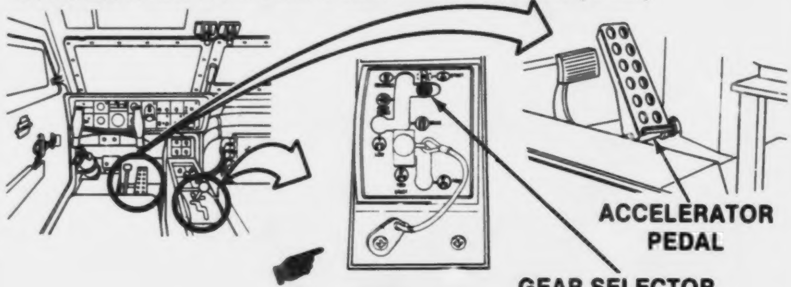
PREVENTIVE MAINTENANCE CHECKS AND SERVICES
DURING (D) OPERATION CHECKS (cont)

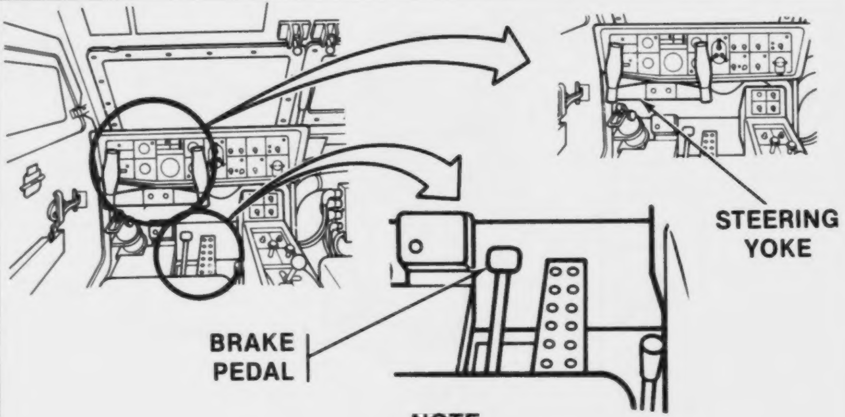
ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	DRIVER'S CONTROLS AND INDICATORS	
	 LIGHTS BO MARKER STOP LIGHT SER DRIVE BO DRIVE PANEL BRT UNLOCK OFF PARK DRIVING LIGHTS SWITCH PANEL LIGHTS SWITCH	
	Move DRIVING LIGHTS switch to BO MARKER.	
	Move PANEL LIGHTS switch to PANEL BRT.	
30	Check that driver's panel lights come on so that gages and switches can be seen.	
	Move DRIVING LIGHTS switch to OFF.	
	Move PANEL LIGHTS switch to OFF.	

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
		
	Pull throttle handle.	
31	Check that throttle operates easily and smoothly. Push in throttle handle.	

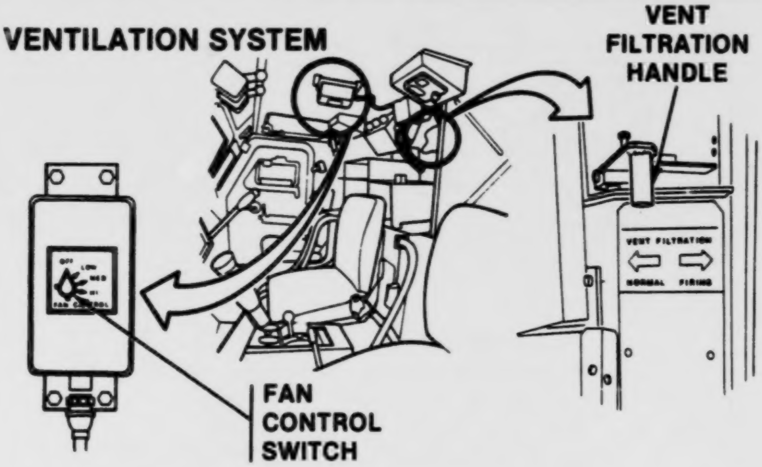
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

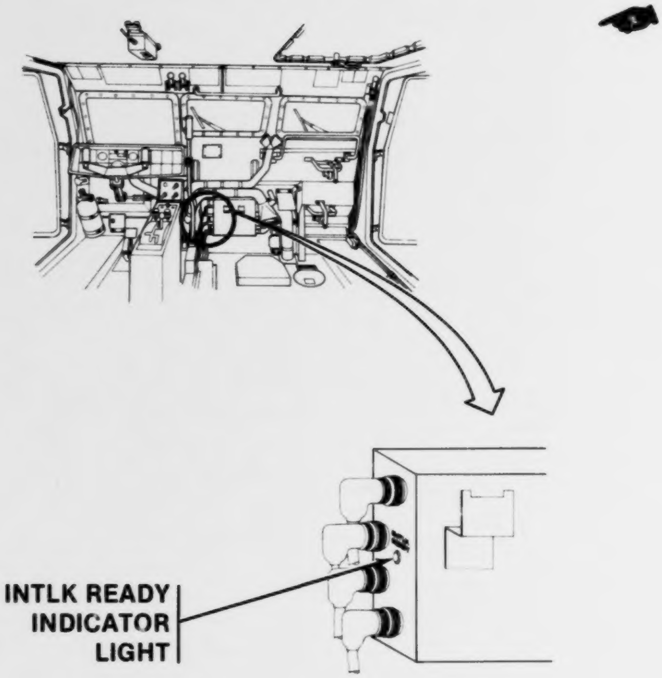
DURING (D) OPERATION CHECKS (cont)

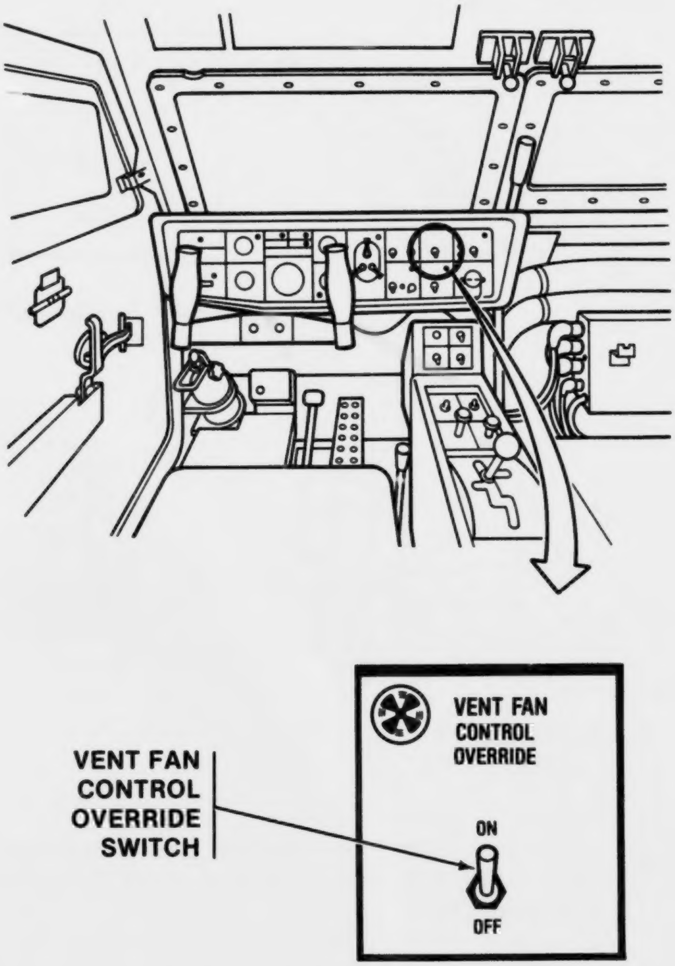
ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	DRIVER'S CONTROLS AND INDICATORS (cont)	
		
	WARNING **Sticking or failed linkages can cause carrier to crash. Soldiers can be killed or injured. If accelerator pedal does not operate smoothly, or engine does not return to idle when accelerator pedal is released, do not drive carrier.**	
32	Drive carrier. See page 2-158. Check accelerator pedal operation.	Accelerator pedal binds when pressed down and released. Engine does not return to idle when accelerator pedal is released.
33	Check gear selector operation.	Gear selector binds when moved. Transmission does not engage, or engages wrong gear when gear selector is put in gear.

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	 **NOTE** **Carrier will pull (steer) to one side if track on that side is brand new and track on the opposite is used track (1000 miles plus). This condition is normal and should decrease after approximately 200 miles of operation.**	
34	Check steering yoke operation.	Carrier wanders to right or left when steering yoke is centered. Steering yoke does not center itself when released.
35	Check carrier brakes.	Brake pedal clearance is less than approximately 3 inches from cab forward wall. Brake pedal touches floor when pushed down, or brake does not return freely to off position when released.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES
DURING (D) OPERATION CHECKS (cont)

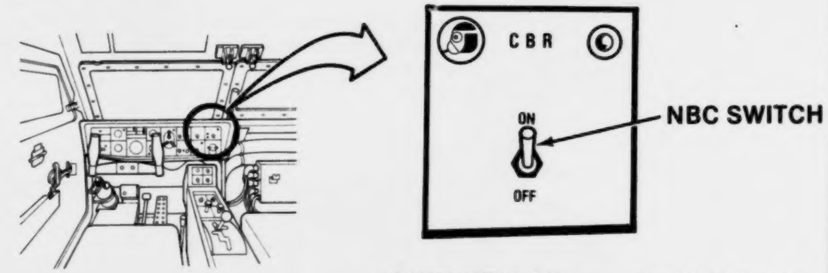
ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	VENTILATION SYSTEM  VENT FILTRATION HANDLE FAN CONTROL SWITCH OFF LOW MED HI FAN CONTROL VENT FILTRATION NORMAL FIRING Operate VENT FAN. See task: OPERATE VENTILATION SYSTEM, page 2-182. Move VENT FILTRATION handle to FIRING position.	
36	Check that VENT FILTRATION handle will engage in FIRING position.	VENT FILTRATION handle will not engage in FIRING position.

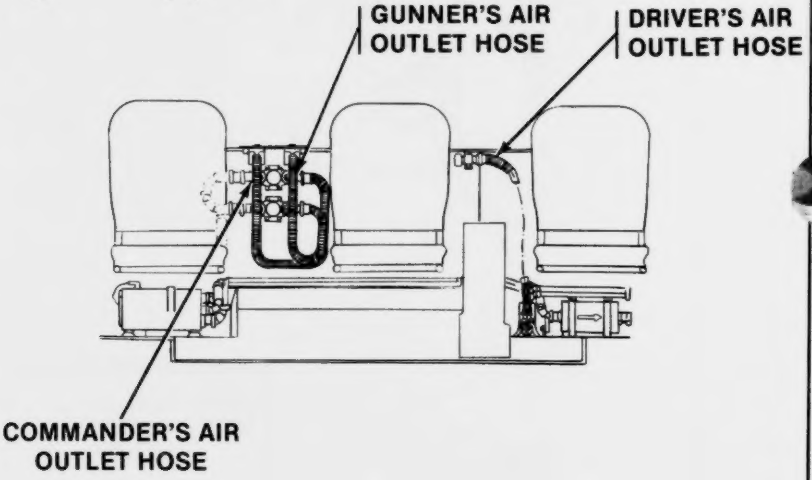
ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
		
36.1	Check that INTLK READY INDICATOR light is on when the cab doors and commander's hatch are closed.	INTLK READY INDICATOR light is not on.
37	Check that air flows from ducts when FAN CONTROL switch is in LO, MED, and HI positions.	No air flows from ducts while switch is in LO or MED position.

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	 VENT FAN CONTROL OVERRIDE ON OFF VENT FAN CONTROL OVERRIDE SWITCH	
38	Move VENT FAN CONTROL OVERRIDE switch to ON. Shut down ventilation system. See task: OPERATE VENTILATION SYSTEM, page 2-182.	

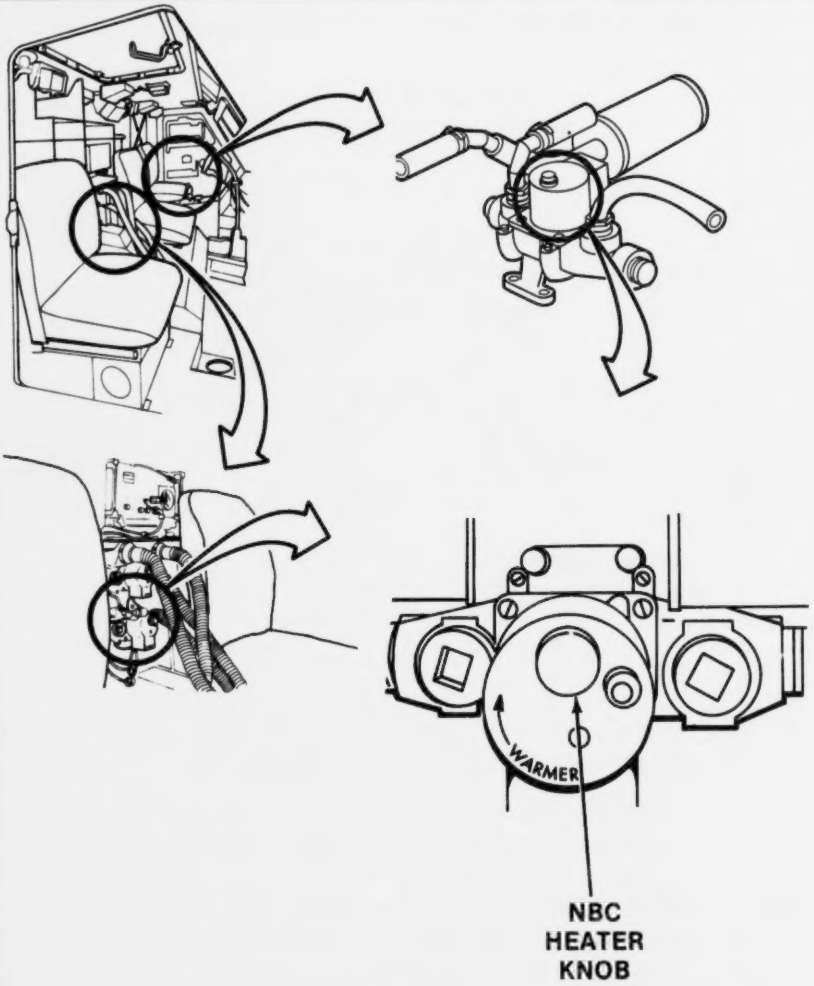
PREVENTIVE MAINTENANCE CHECKS AND SERVICES
DURING (D) OPERATION CHECKS (cont)

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	NBC SYSTEM	


CBR
ON
OFF
NBC SWITCH

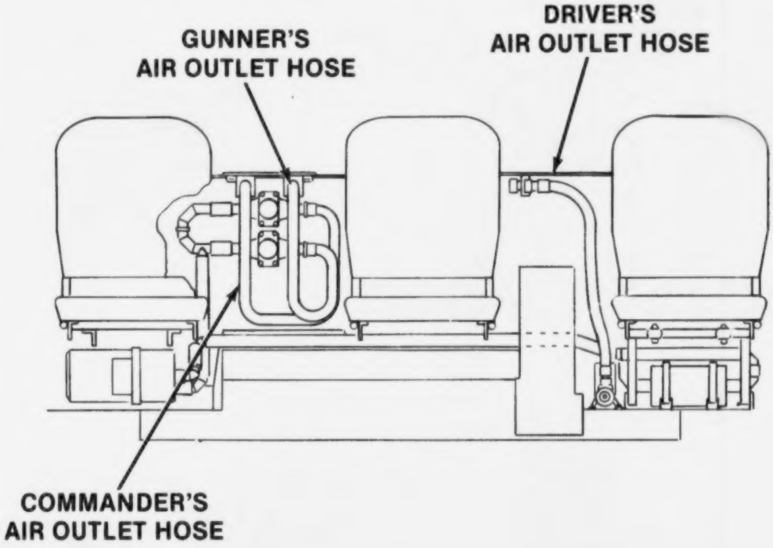

GUNNER'S AIR OUTLET HOSE
DRIVER'S AIR OUTLET HOSE
COMMANDER'S AIR OUTLET HOSE

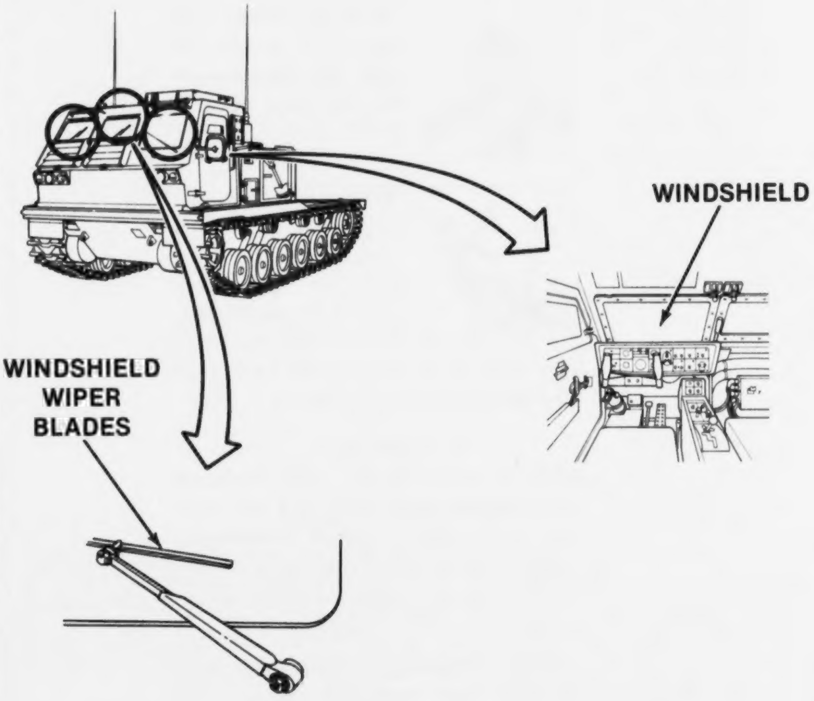
ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	Slide spring clip from holes on precleaner filter unit. See task: OPERATE NBC SYSTEM, page 2-204. Move NBC switch to ON.	
39	Check that steady air flow is coming from commander's, gunner's, and driver's air outlet hoses.	Air flow is blocked at any air outlet hose.

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
		
	Turn commander's, gunner's, and driver's NBC heater knobs all the way to the right.	
40	Check that green light on commander's, gunner's, and driver's NBC heater knob goes on.	

PREVENTIVE MAINTENANCE CHECKS AND SERVICES

DURING (D) OPERATION CHECKS (cont)

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	NBC SYSTEM (cont)  DRIVER'S AIR OUTLET HOSE GUNNER'S AIR OUTLET HOSE COMMANDER'S AIR OUTLET HOSE	
41	Check commander's, gunner's, and driver's air outlet hoses for holes and other damage. Remove commander's, gunner's, and driver's air outlet hoses from stowed position. Wait 15—20 minutes.	
42	Check that warm air is coming from ends of commander's, gunner's, and driver's air outlet hoses. Turn commander's, gunner's, and driver's NBC heater knobs to OFF. Slide spring clip over holes on precleaner filter unit. See task: OPERATE NBC SYSTEM, page 2-204. Install commander's, gunner's, and driver's air outlet hoses to stowed position.	

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	CARRIER WINDSHIELDS  **NOTE** **Louvers must be in stowed position.**	
43	Check windshield for bad cracks or scratches which obstruct vision.	
44	Check windshield wiper blades for wear and proper operation. Worn windshield wiper blades will not properly clean water from windshield.	

AFTER (A) OPERATION CHECKS

You may need to clean the inside of your carrier in order to perform the required checks. If you clean the inside of your carrier be sure to observe the following:

WARNING

Solvent fumes can burn and could poison you. Read warning on front page of this manual.

Benzene (benzol), paint thinner, gasoline, and diesel fuel oil can burn and could poison you. Do not use benzene (benzol), paint thinner, gasoline, or diesel fuel oil for cleaning.

CAUTION

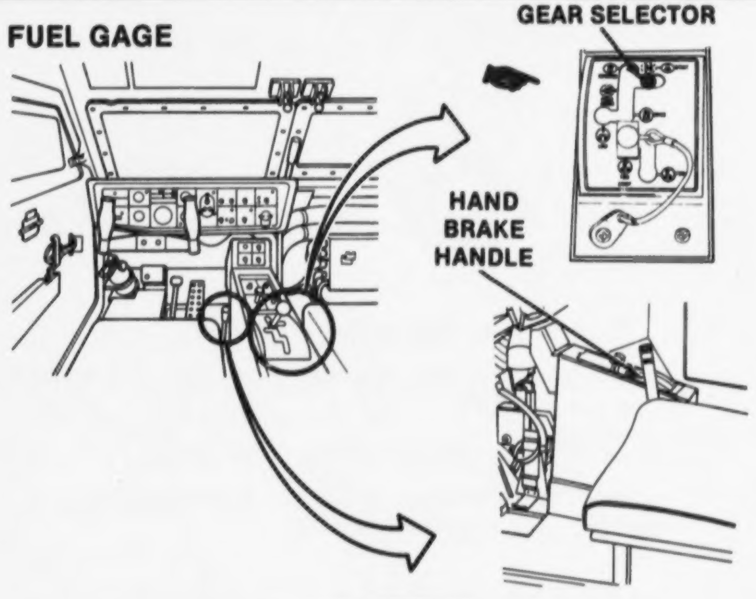
Steam, water, or air under pressure can damage sighting and fire control equipment gears and bearings. Do not clean inside of carrier with steam, water, or air under pressure.

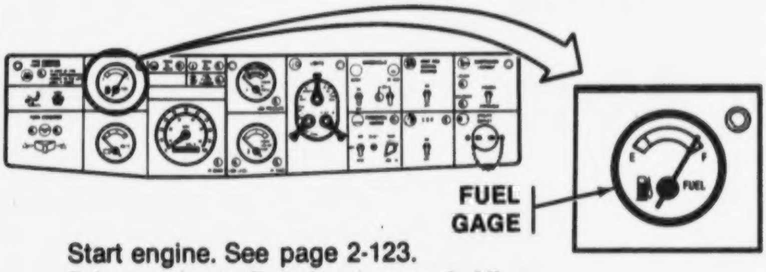
Water entering engine exhaust system can damage engine. Do not allow water to enter engine exhaust system.

Petroleum products will damage rubber that is not resistant to petroleum. Do not get petroleum products on rubber parts.

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:

FUEL GAGE


GEAR SELECTOR
HAND BRAKE HANDLE


FUEL GAGE
E
F
FUEL

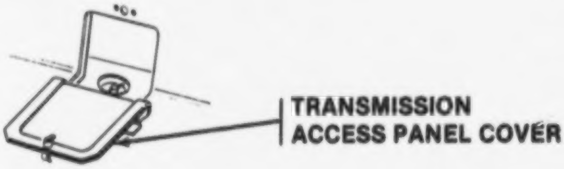
Start engine. See page 2-123.
Drive carrier to firm, level ground. Allow carrier to coast to a stop. See task: DRIVE CARRIER, page 2-158.
Move gear selector to N (neutral).
Set hand brake.

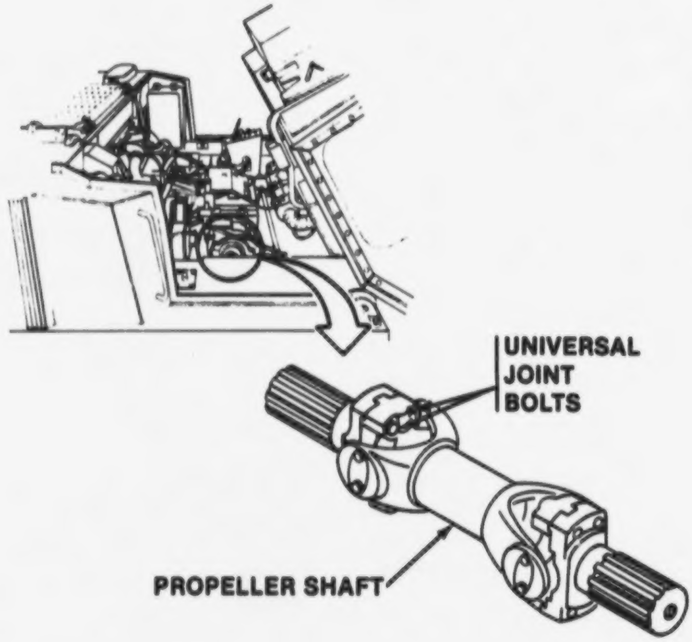
45 Check FUEL gage.

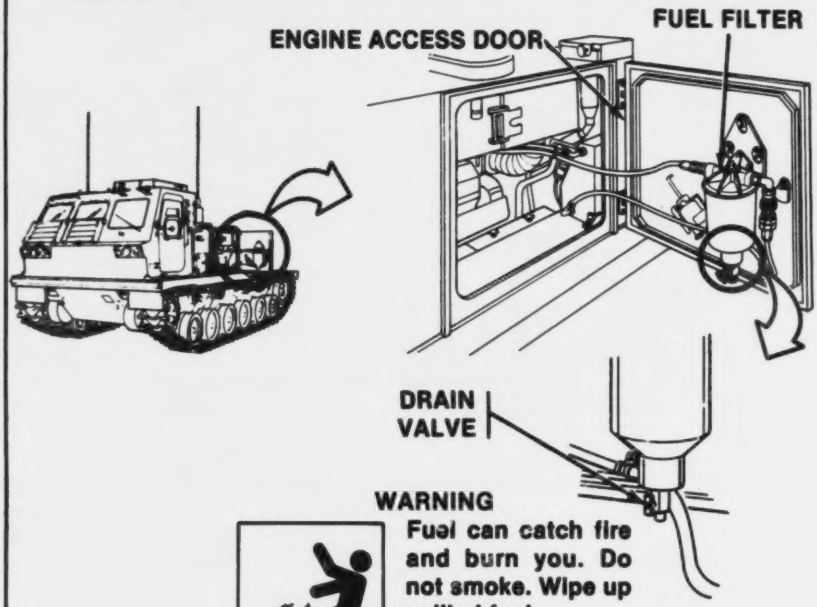
If FUEL gage pointer is not in green zone, add fuel. See task: FUEL CARRIER, page 2-169.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES

AFTER (A) OPERATIONS CHECKS (cont)

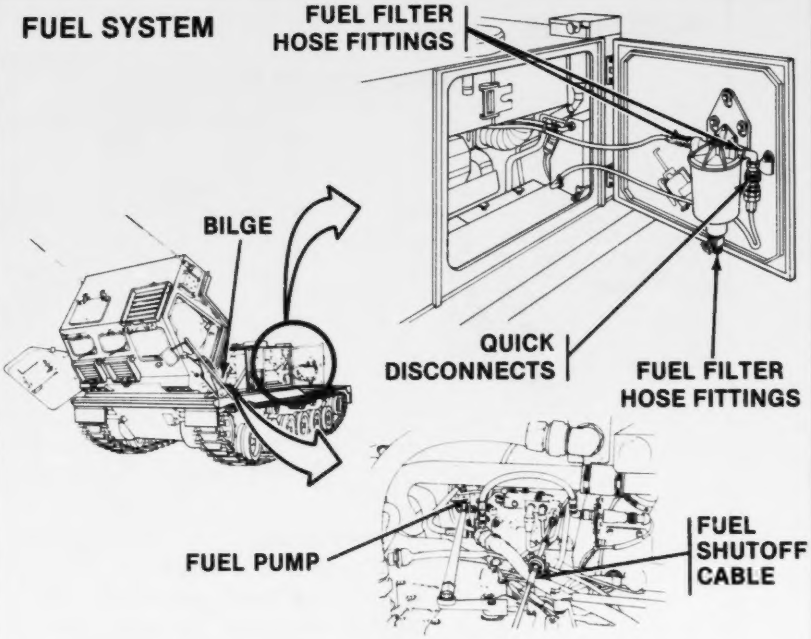
ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	TRANSMISSION	
		
	Stop engine. See page 2-167. Tilt gunner's seat forward. See task: OPERATE SEATS, page 2-112. Open transmission access panel cover.	
46	Check transmission oil level. Add transmission oil as needed. See LO 9-1450-646-12.	
	FINAL DRIVES	
47	Check oil level in right and left final drives. Add oil as needed. See LO 9-1450-646-12.	

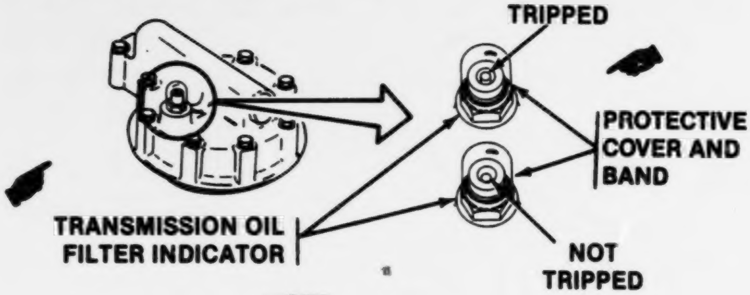
ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	FINAL DRIVES (cont)	
		
	NOTE **Universal joint bolts on left and right propeller shafts are checked the same way. Both propeller shafts should be checked.**	
	Raise cab. See task: RAISE/LOWER CAB, page 2-194.	
47.1	Check eight universal joint bolts on ends of propeller shaft, connecting to final drive and transmission, for looseness.	Universal joint bolts are loose.

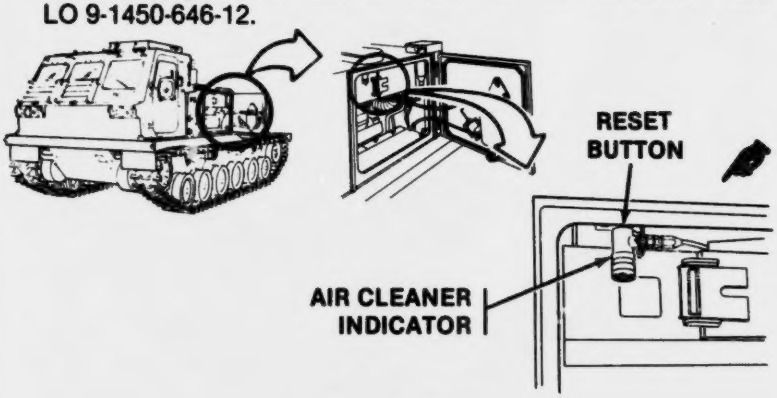
ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	FUEL FILTER  **WARNING** **Fuel can catch fire and burn you. Do not smoke. Wipe up spilled fuel.** Open engine access door. See task: OPEN/CLOSE ENGINE ACCESS DOOR, page 2-191. Hold container under drain valve on fuel filter. Open drain valve.	
48	Check that fuel filter is drained until raw fuel comes out. Close drain valve. If fuel filter will not drain, notify unit maintenance.	
49	Check drained fuel for contaminants. If contaminants are found, note the type and amount. Notify unit maintenance.	

PREVENTIVE MAINTENANCE CHECKS AND SERVICES

AFTER (A) OPERATION CHECKS (cont)

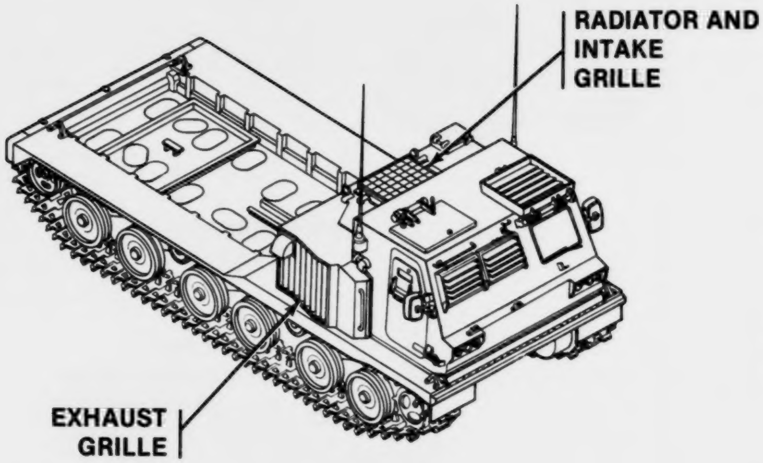
ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	FUEL SYSTEM  FUEL FILTER HOSE FITTINGS BILGE QUICK DISCONNECTS FUEL FILTER HOSE FITTINGS FUEL PUMP FUEL SHUTOFF CABLE	
49.1	Check that fuel shutoff cable is not binding or broken.	Fuel shutoff cable is binding or broken.
	Raise cab. See task: RAISE/LOWER CAB, page 2-194.	
50	Check bilge for fuel.	
51	Check fuel filter hose fittings for fuel leaks.	
52	Check quick disconnects for fuel leaks.	
53	Check fuel pump for fuel leaks.	Any Class III fuel leaks found.

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
53.1	Check FUEL FILTER CLOGGED WARNING light. If FUEL FILTER CLOGGED WARNING light comes on, notify unit maintenance.	
	 TRIPPED PROTECTIVE COVER AND BAND TRANSMISSION OIL FILTER INDICATOR NOT TRIPPED	
	NOTE **Engine should be left running during check 53.2.** **If protective cover or band are damaged, notify unit maintenance.**	
53.2	Check transmission oil filter indicator. If transmission oil filter indicator is tripped, reset it.	Transmission oil filter indicator trips after being reset once.
	WARNING **Fuel can catch fire and burn you. Do not smoke. Wipe up spilled fuel.**	
53.3	Check engine compartment for fuel, oil, or coolant leaks. Lower cab. See task: RAISE/LOWER CAB, page 2-194.	Class III oil, fuel, or coolant leak is found.

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	ENGINE OIL LEVEL	
54	Check engine oil level. Add oil as needed. See LO 9-1450-646-12.  	
	WARNING **NBC agents can kill you. Do decontamination steps when carrier has been under attack. Do not service air cleaner or vent system.**	
55	Check AIR CLEANER indicator. If AIR CLEANER indicator is red, reset it by pressing down reset button on top of indicator. Indicator will turn green. Start engine. See task: START ENGINE/WARM UP TRANSMISSION, page 2-123. Press down accelerator pedal fully for 5 seconds and release. Allow engine to idle for 30 seconds. Stop engine. See task: STOP ENGINE, page 2-167.	AIR CLEANER indicator is red after being reset.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES
AFTER (A) OPERATION CHECKS (cont)

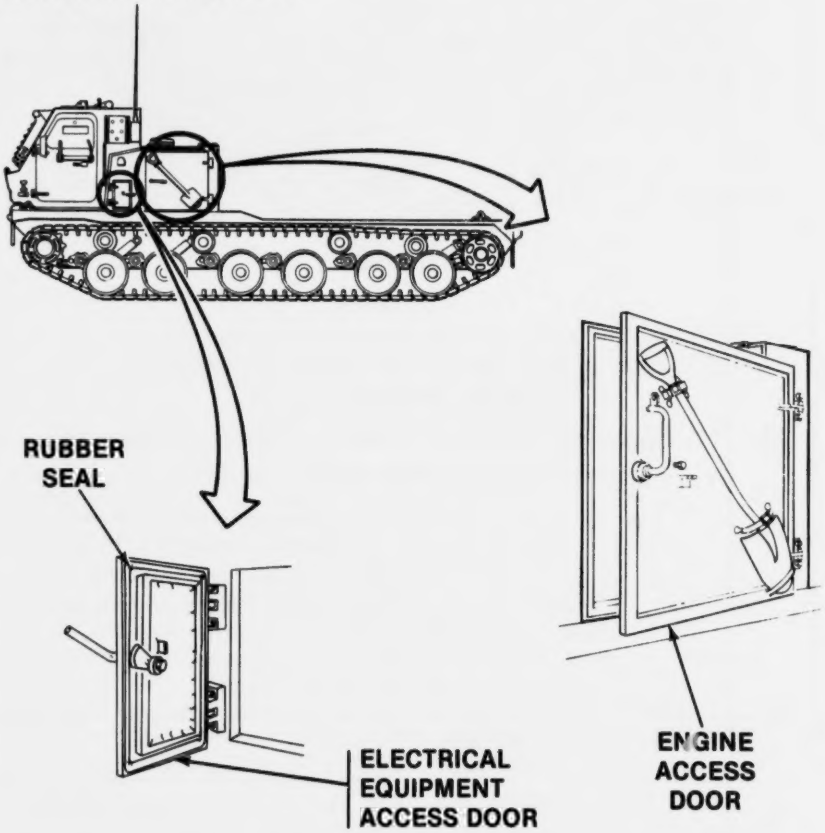
ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	COOLING SYSTEM	



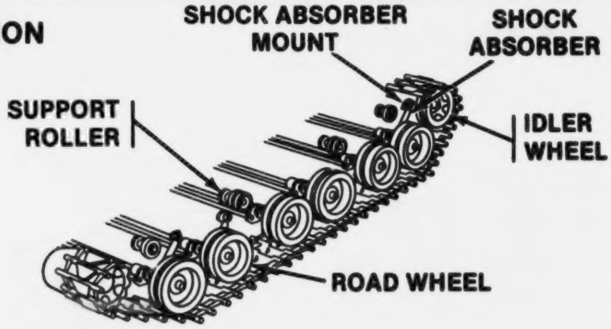
WARNING

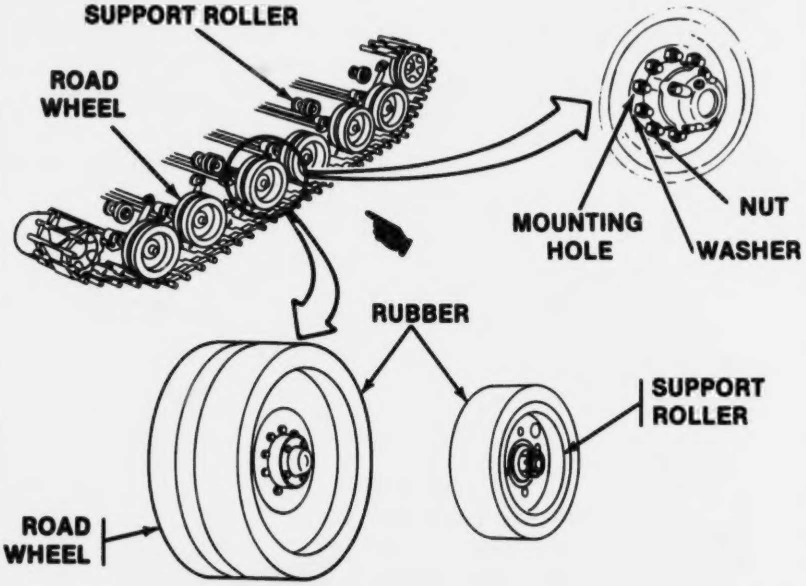
Electricity from antennas can shock you. Do not touch radio antenna if radio is in use. Check with soldiers inside carrier to make sure radio is not in use.

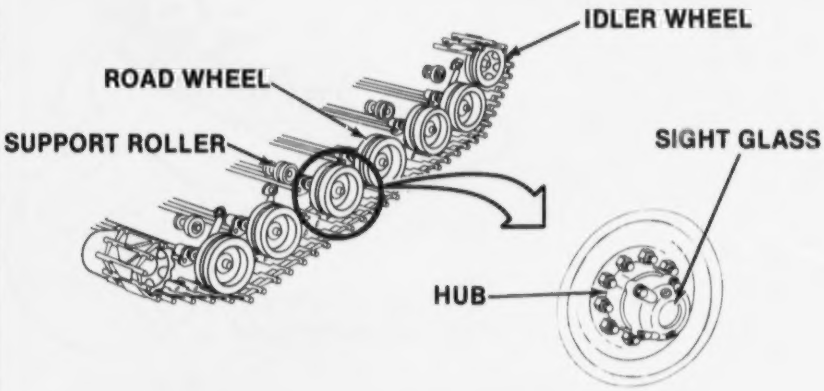
ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
56	Check engine coolant level. Add coolant as needed. See task: CHECK/FILL RADIATOR, page 3-70.	
57	Check radiator, intake grille, and exhaust grille for debris and damage.	

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	CARRIER EXTERIOR  RUBBER SEAL ELECTRICAL EQUIPMENT ACCESS DOOR ENGINE ACCESS DOOR	
	Open electrical equipment access door.	
58	Check electrical equipment access door and engine access door for damaged hinges, latches, cracks, and separation of rubber seals. Close electrical equipment access door. Close engine access door. See task: OPEN/CLOSE ENGINE ACCESS DOOR, page 2-191.	

PREVENTIVE MAINTENANCE CHECKS AND SERVICES
AFTER (A) OPERATION CHECKS (cont)

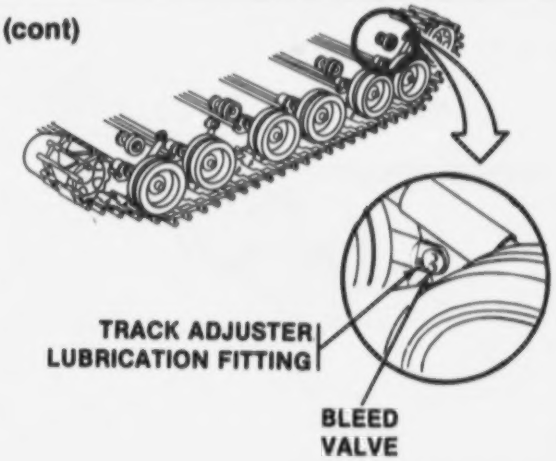
ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	SUSPENSION  SHOCK ABSORBER MOUNT SHOCK ABSORBER SUPPORT ROLLER IDLER WHEEL ROAD WHEEL **NOTE** **Left and right tracks are checked the same way. Both sides of carrier should be checked.**	
59	Check for missing, broken, or leaking shock absorbers and missing or broken shock mounts.	Shock absorber is missing, broken, or leaking. Shock mount is missing or broken.
60	Check for missing or damaged road wheels, idler wheels, and support rollers.	Road wheel, idler wheel, or support roller is cracked or missing

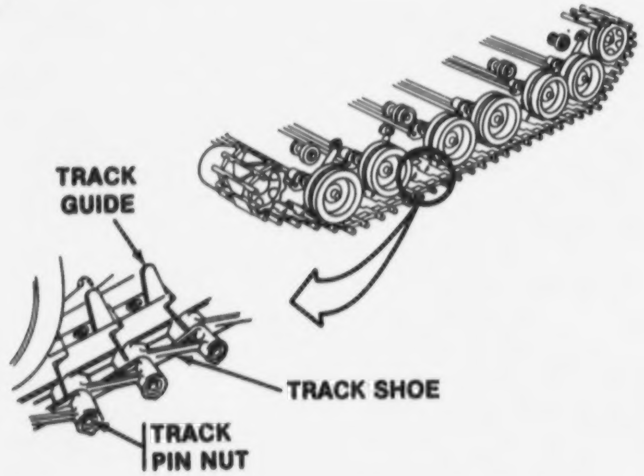
ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	 SUPPORT ROLLER ROAD WHEEL MOUNTING HOLE NUT WASHER RUBBER SUPPORT ROLLER ROAD WHEEL **NOTE** **The following suspension system checks should be performed while slowly moving carrier forward. Both sides of carrier should be checked.**	
60.1	Check road wheels and support rollers for loss of rubber, pitting, separation of rubber from metal backing, and chunking.	Separation of 1/2 of rubber contact from metal wheel and/or chunking across 1/2 the width of wheel surface exists.
61	Check for worn mounting holes and loose nuts on road wheels, idler wheels, and support rollers by looking for shiny area around nuts and washers.	

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	 IDLER WHEEL ROAD WHEEL SUPPORT ROLLER SIGHT GLASS HUB **WARNING** **Hot hubs can burn you. Take care when you pass hands near hub.**	
62	Check all hubs for any large temperature differences. Pass hands near hubs.	Any hub is overheated.
63	Check road wheels, idler wheels, and support roller oil through sight glasses. Look for milky color and other signs of contamination.	Any road wheel, idler wheel, or support roller oil has milky color or signs of contamination.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES

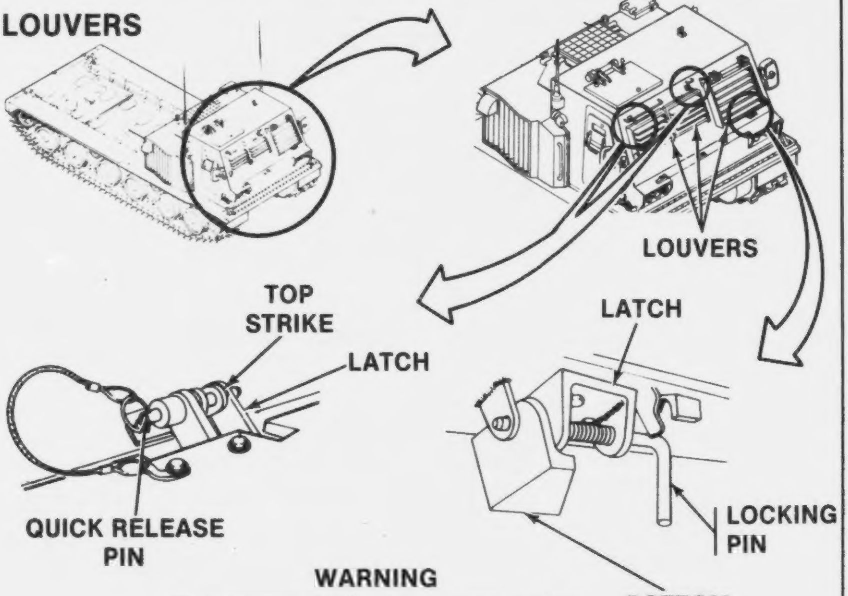
AFTER (A) OPERATION CHECKS (cont)

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	SUSPENSION (cont) 	
64	Check track tension. Adjust track tension as needed. See task: ADJUST TRACK TENSION, page 3-40.	
65	Check track adjuster lubrication fitting and bleed valve for leaks. If track adjuster lubrication fitting leaks, replace it. See task: REPLACE TRACK ADJUSTER LUBRICATION FITTING, page 3-68.	Track adjuster lubrication fitting or bleed valve leaks or track is loose.

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
		
66	Check for missing track pin nuts, cracked, bent, or broken track guides, and broken track shoes. Start engine. See task: START ENGINE/WARM UP TRANSMISSION, page 2-123. Drive carrier 1/2 length of track. See task: DRIVE CARRIER, page 2-158. Stop engine. See task: STOP ENGINE, page 2-167.	
66.1	Check again for cracked, bent, or broken track guides and broken track shoes.	One or more broken track shoes on either side of carrier or three or more broken track guides in a row.

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:

LOUVERS



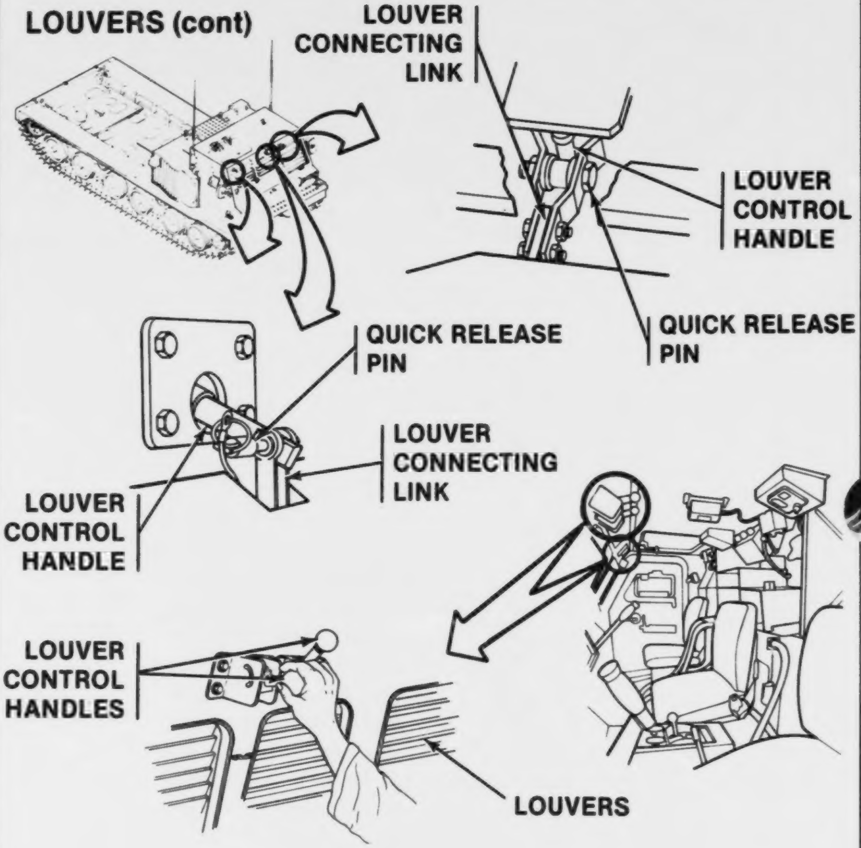
WARNING

Louvers can swing down and kill or injure you when you raise cab. Make sure locking pins secure louvers in stowed position before you raise cab. Stay clear of louvers when cab is being raised.

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
67	Check to see that all louvers are in place.	
68	Check that latch mates with top strike, and quick release pin is secured at commander's and gunner's stations.	
69	Check that latch mates with bottom strike and locking pin is secured at driver's station.	Louvers, top strike, bottom strike, locking pin, or quick release pin is missing or broken.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES

AFTER (A) OPERATION CHECKS (cont)

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	LOUVERS (cont)  LOUVER CONNECTING LINK LOUVER CONTROL HANDLE QUICK RELEASE PIN QUICK RELEASE PIN LOUVER CONNECTING LINK LOUVER CONTROL HANDLE LOUVER CONTROL HANDLES LOUVERS	
70	Check that louver control handle mates with louver connecting link, and quick release pin secures both. Push in louver control handle and move up and down. Open and close louvers.	
71	Check that all louvers work.	Louvers will not open and close.

WEEKLY (W) OPERATION CHECKS

You may need to clean the inside of your carrier in order to perform the required checks. If you clean the inside of your carrier, be sure to observe the following:

WARNING

Solvent fumes can burn and could poison you. Read warning on front page of this manual.

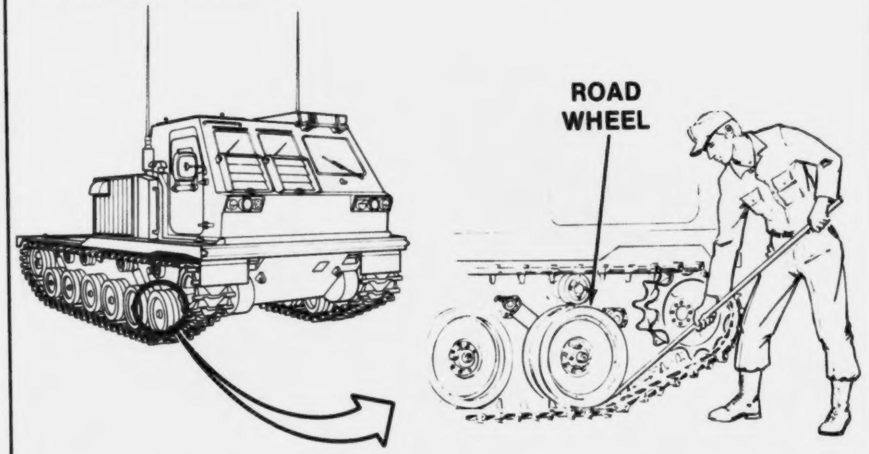
Benzene (benzol), paint thinner, gasoline, and diesel fuel oil can burn and could poison you. Do not use benzene (benzol), paint thinner, gasoline, or diesel fuel oil for cleaning.

CAUTION

Steam, water, or air under pressure can damage sighting and fire control equipment gears and bearings. Do not clean inside of carrier with steam, water, or air under pressure.

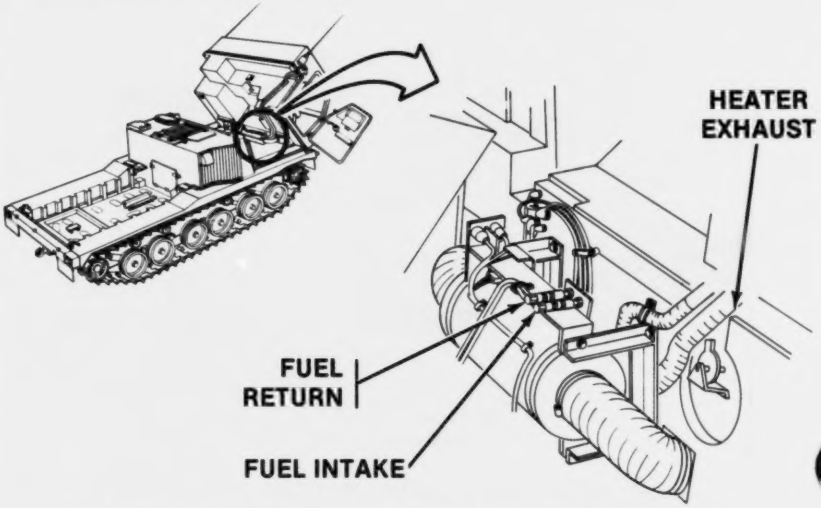
Water entering engine exhaust system can damage engine. Do not allow water to enter engine exhaust system.

Petroleum products will damage rubber that is not resistant to petroleum. Do not get petroleum products on rubber parts.

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	TORSION BARS  Lift each road wheel from front with crowbar. If crowbar lifts road wheel easily, torsion bar is broken.	
71.1	Check road wheels No. 1 thru No. 6 on both sides of carrier for broken torsion bars.	Torsion bar No. 1 or No. 6 or any two other torsion bars are broken.
	BATTERIES	
71.2	Check batteries. See task: CHECK CARRIER BATTERIES, page 3-72.	Battery is missing or cracked. Battery terminal or post is broken. Electrolyte level is low.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES
WEEKLY (W) OPERATION CHECKS (cont)

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	PERSONNEL HEATER	



Raise cab. See task: RAISE/LOWER CAB, page 2-194.

WARNING

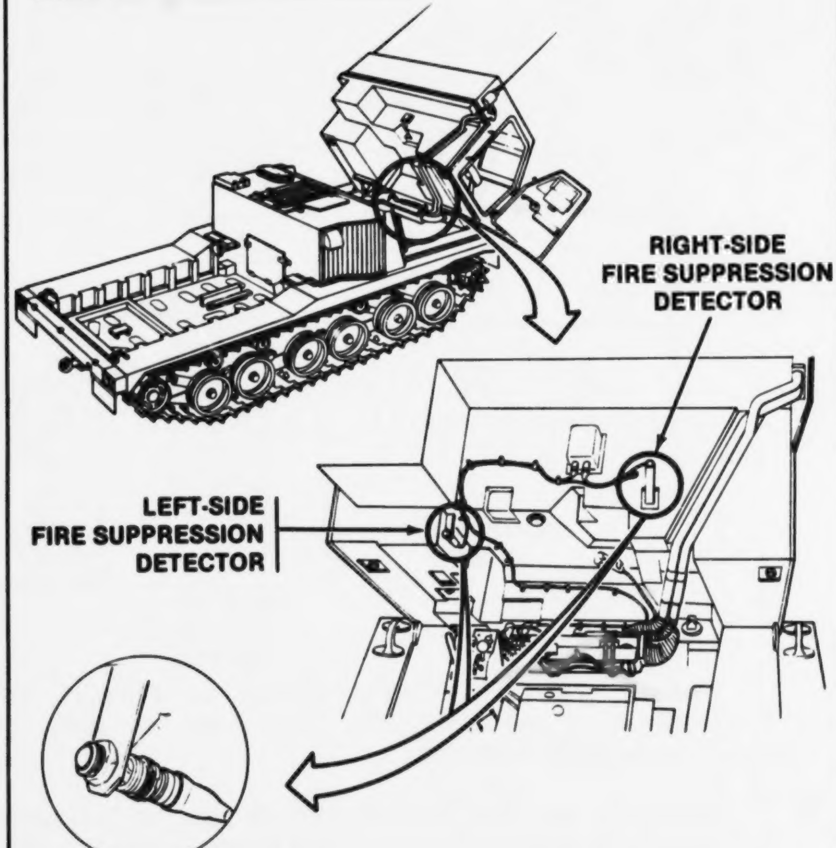
Fuel can catch fire and burn you. Do not smoke. Wipe up spilled fuel.

Exhaust from engine and heater can poison you. Do not breathe exhaust gases. See warning on front page of this manual.

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
72	Check heater exhaust, fuel intake, and fuel return for leaks.	Fuel or exhaust leaks found.

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:

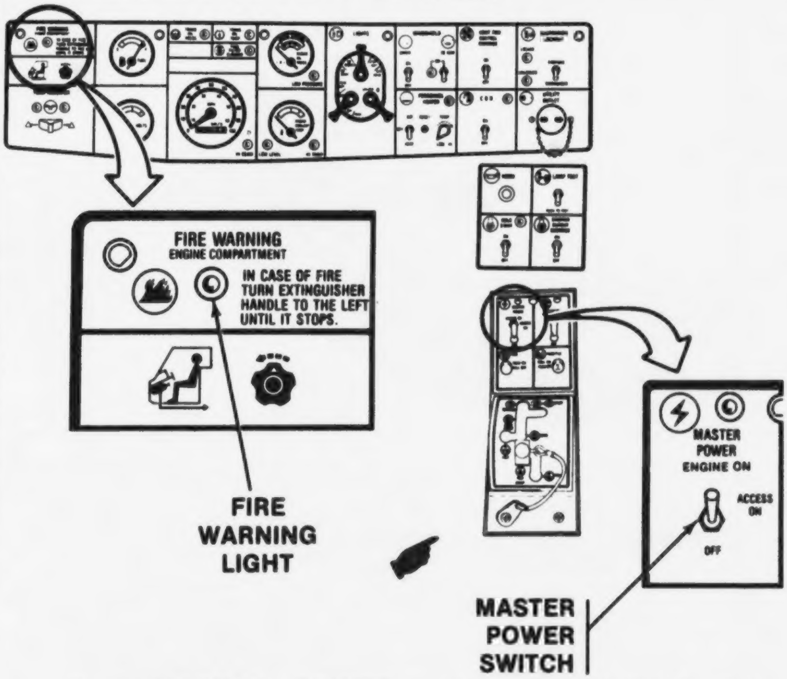
FIRE SUPPRESSION SYSTEM

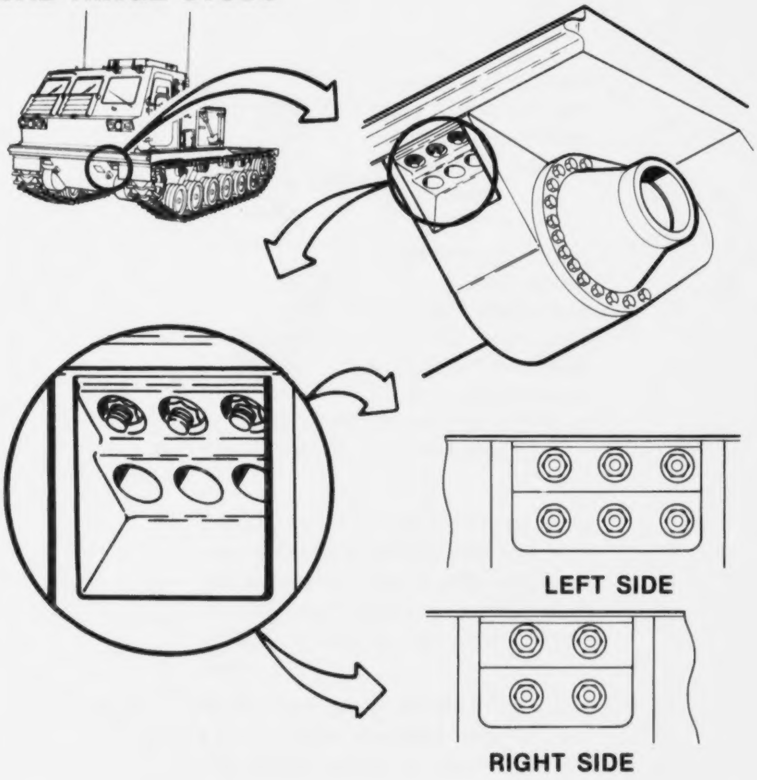

RIGHT-SIDE FIRE SUPPRESSION DETECTOR
LEFT-SIDE FIRE SUPPRESSION DETECTOR

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
73	Check fire suppression detectors for damage and dirty lenses.	Either fire suppression detector is broken.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES

WEEKLY (W) OPERATION CHECKS (cont)

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	FIRE SUPPRESSION SYSTEM (cont)	
	 FIRE WARNING ENGINE COMPARTMENT IN CASE OF FIRE TURN EXTINGUISHER HANDLE TO THE LEFT UNTIL IT STOPS. FIRE WARNING LIGHT MASTER POWER ENGINE ON ACCESS ON OFF MASTER POWER SWITCH	
	Turn MASTER POWER switch to ENGINE ON. Shine a red light into each lens of both fire suppression detectors.	
74	Check to see that FIRE WARNING light on instrument panel comes on and warning tone sounds.	FIRE WARNING light fails to come on. Warning tone fails to sound.
	Turn MASTER POWER switch to OFF. Lower cab. See task: RAISE/LOWER CAB, page 2-194.	

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	CAB HINGE STUDS 	
74.1	Check for missing or broken off cab hinge studs, locknuts, and washers.	Cab hinge studs, locknuts, and washers are broken off or missing.

MONTHLY (M) OPERATION CHECKS

You may need to clean the inside of your carrier in order to perform the required checks. If you clean the inside of your carrier, be sure to observe the following:

WARNING

Solvent fumes can burn and could poison you. Read warning on front page of this manual.

Benzene (benzol), paint thinner, gasoline, and diesel fuel oil can burn and could poison you. Do not use benzene (benzol), paint thinner, gasoline, or diesel fuel oil for cleaning.

CAUTION

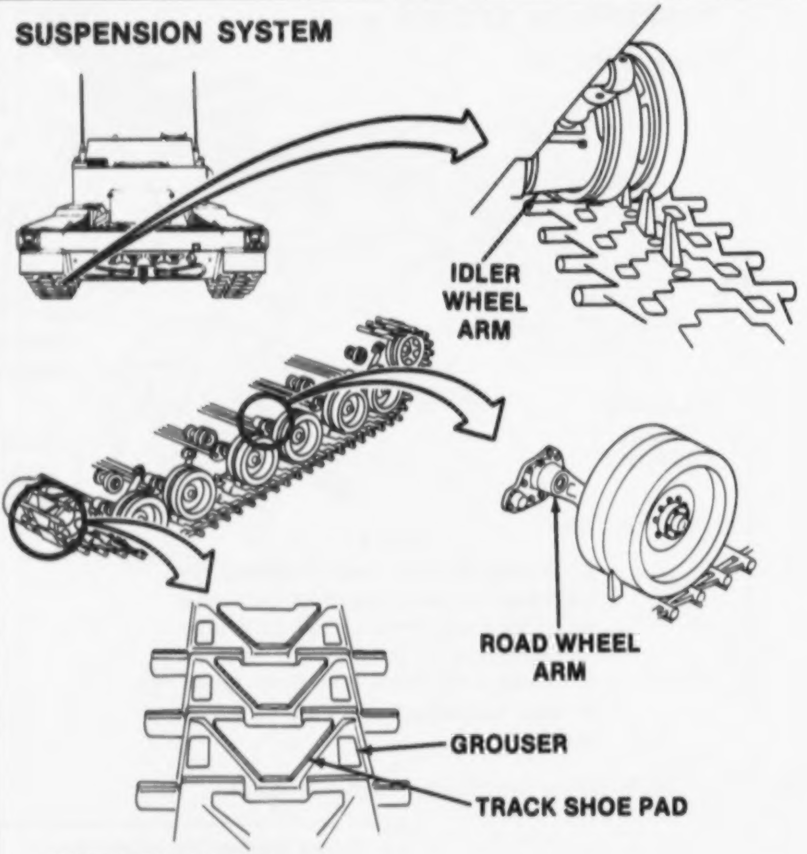
Steam, water, or air under pressure can damage sighting and fire control equipment gears and bearings. Do not clean inside of carrier with steam, water, or air under pressure.

Water entering engine exhaust system can damage engine. Do not allow water to enter engine exhaust system.

Petroleum products will damage rubber that is not resistant to petroleum. Do not get petroleum products on rubber parts.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES

MONTHLY (M) OPERATION CHECKS

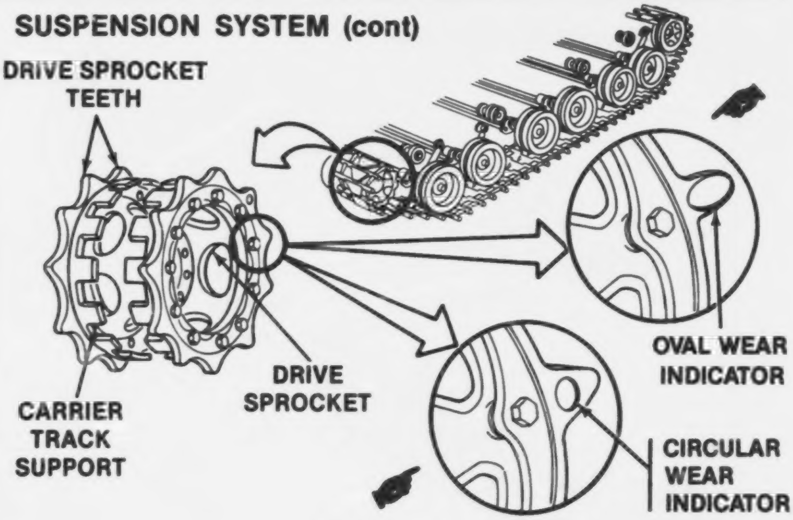
<table>
<tr><th>ITEM NO.</th><th>ITEM TO BE INSPECTED
Procedure</th><th>Equipment will be reported NOT READY/AVAILABLE if:</th></tr>
<tr><td></td><td>SUSPENSION SYSTEM


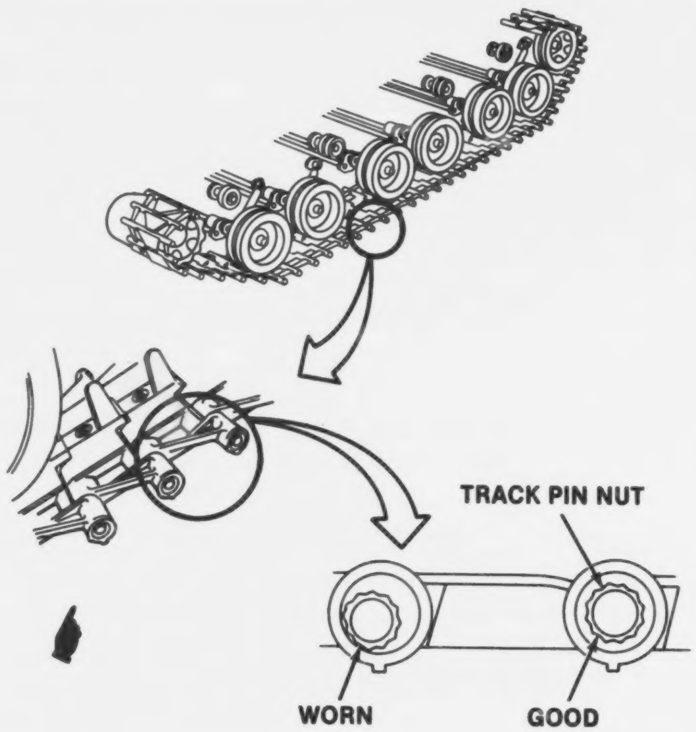
IDLER WHEEL ARM
ROAD WHEEL ARM
GROUSER
TRACK SHOE PAD

Check 75 deleted.</td><td></td></tr>
<tr><td>76</td><td>Check for broken or bent road and idler wheel arms.</td><td>One or more road or idler wheel arms are bent or broken.</td></tr>
<tr><td>77</td><td>Check for track shoe pads worn even with grouser or missing track shoe pads. Replace any pads that are worn even with grouser.</td><td></td></tr>
</table>

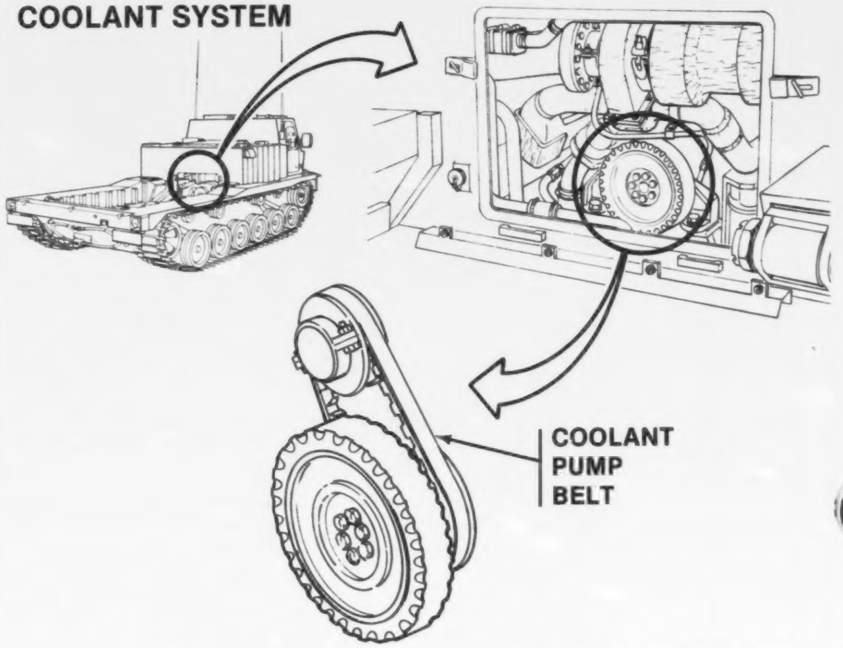
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

MONTHLY (M) OPERATION CHECKS (cont)

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	SUSPENSION SYSTEM (cont)	
	 DRIVE SPROCKET TEETH CARRIER TRACK SUPPORT DRIVE SPROCKET OVAL WEAR INDICATOR CIRCULAR WEAR INDICATOR	
	NOTE **A circular or oval wear indicator is inscribed on both sides of only one tooth on each drive sprocket. It may be necessary to drive carrier forward to locate wear indicator. Both types of wear indicators are read the same way.**	
78	Check drive sprocket tooth for wear.	Drive sprocket tooth worn to wear indicator on both sides of drive sprocket.
79	Check drive sprocket and drive sprocket teeth for breaks and cracks.	Drive sprocket is cracked, or three or more drive sprocket teeth on carrier track supports are broken.

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
		
	Check 80 deleted.	
	NOTE **Off centered track pin nuts indicate worn bushings.**	
81	Check that track pin nuts are centered. If track pin nuts are not centered, notify unit maintenance.	

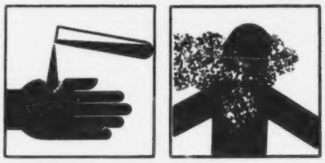
PREVENTIVE MAINTENANCE CHECKS AND SERVICES
MONTHLY (M) OPERATION CHECKS (cont)

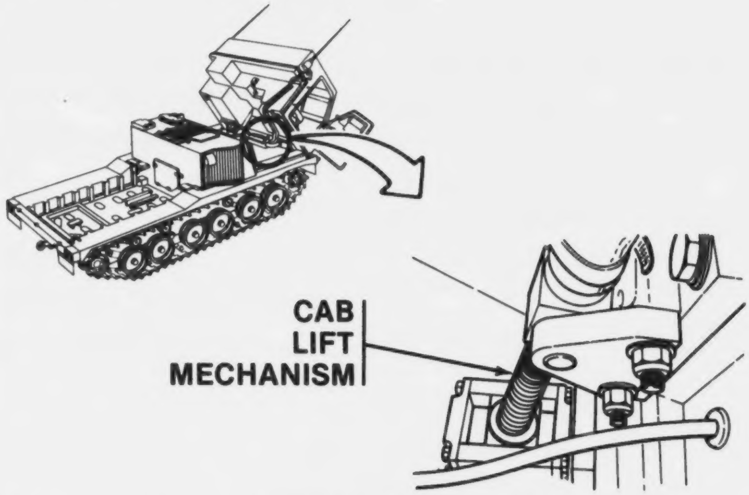
ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	COOLANT SYSTEM 	
	Remove engine access cover. See task: REMOVE/INSTALL ENGINE ACCESS COVER, page 2-192.	
82	Check for worn, cracked, or missing coolant pump belt.	Coolant pump belt is missing, worn, or cracked.
83	Check all hoses and connections for leaks or wear spots.	Class III leak is found.
	Install engine access cover. See task: REMOVE/INSTALL ENGINE ACCESS COVER, page 2-192.	

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	RIGHT ANGLE FAN DRIVE GEARBOX	
	NOTE **Vehicle should be on level surface for accurate measurement with engine oil.**	
84	Check right angle fan drive gearbox. Remove dipstick. Use 3/8 inch open end wrench. Wipe dry. Screw dipstick in gearbox fingertight. Remove dipstick and check oil level. Add oil as required to bring level to FILL TO HERE line. See LO 9-1450-646-12.	
	Check 85 deleted.	

PREVENTIVE MAINTENANCE CHECKS AND SERVICES

MONTHLY (M) OPERATION CHECKS (cont)

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	SUSPENSION LOCKOUT SYSTEM **WARNING**  **Hydraulic fluid is poisonous and can be absorbed by your skin. It can make you sick or paralyze you. Do not let hydraulic fluid touch your skin. Read the warning in front of this manual.**	
86	Check hydraulic fluid level in suspension lockout system. Add hydraulic fluid as needed. See LO 9-1450-646-12.	
87	Check around pump area for leaks or damage.	
	If leaks or damage are found, notify organizational maintenance.	
	Engage suspension lockout system. See task: OPERATE SUSPENSION LOCKOUT, page 2-172.	
88	Check that SUSPENSION LOCKOUT LOCKED indicator light comes on, and stays on for 20 minutes.	
	If the SUSPENSION LOCKOUT LOCKED indicator light does not remain on for 20 minutes, notify organizational maintenance.	
	Disengage suspension lockout system. See task: OPERATE SUSPENSION LOCKOUT, page 2-172.	

ITEM NO.	ITEM TO BE INSPECTED Procedure	Equipment will be reported NOT READY/AVAILABLE if:
	CAB LIFT MECHANISM	
		
	Raise cab. See task: RAISE/LOWER CAB, page 2-194.	
89	Check cab lift mechanism for galling or stripping.	Cab lift mechanism is galled or stripped.
90	Check cab lift mechanism lubrication. Lubricate if necessary. See LO 9-1450-646-12.	
	Lower cab. See task: RAISE/LOWER CAB, page 2-194.	

Section III. OPERATION UNDER USUAL CONDITIONS

TASK INDEX

Task	Page
Open/Close Personnel Doors and Door Assemblies	2-94
Open/Close Commander's Hatch Cover	2-101
Operate Louvers	2-104
Operate Seats	2-112
Operate Intercom System	2-121
Start Engine/Warm Up Transmission	2-123
Start Engine Using Outside Power Source	2-137
Drive Carrier	2-158
Stop Engine	2-167
Fuel Carrier	2-169
Operate Suspension Lockout	2-172
Operate Windshield Wipers and De-Icer	2-175
Operate Personnel Heater/Defogger	2-176
Operate Ventilation System	2-180
Operate Carrier Lights	2-184
Open/Close Engine Access Door	2-191
Remove/Install Engine Access Cover	2-192
Raise/Lower Cab	2-194

OPEN/CLOSE PERSONNEL DOORS AND DOOR ASSEMBLIES

DESCRIPTION

This task covers: Open/Close Personnel Doors From Outside Carrier (page 2-94). Open/Close Personnel Doors From Inside Carrier (page 2-96). Close/Open Ballistic Window (page 2-97). Open/Close Blackout Cover (page 2-98).

INITIAL SETUP

Personnel Required:	Equipment Conditions:
Driver (D)	Carrier parked
Commander (C)	Hand brake set (page 2-167)

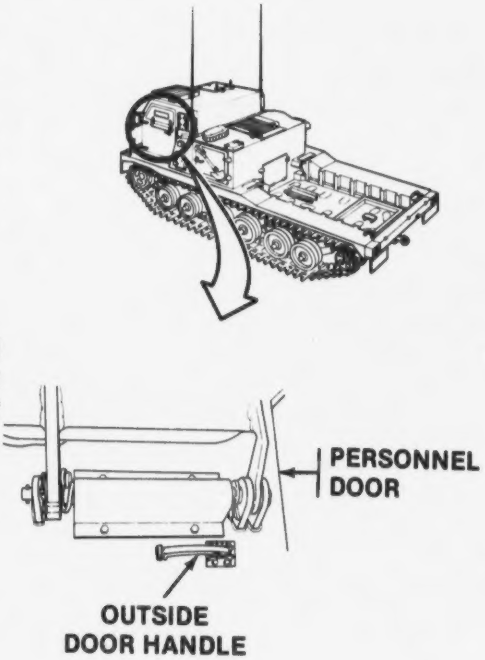
OPEN/CLOSE PERSONNEL DOORS FROM OUTSIDE CARRIER

WARNING

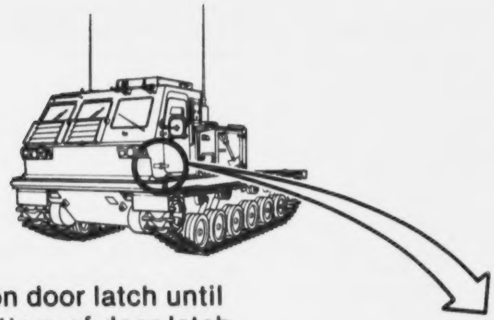
Close carrier doors, hatch, ballistic window assemblies, and blackout covers during rocket launch operations. You could be hurt or killed by backblast or flying objects.

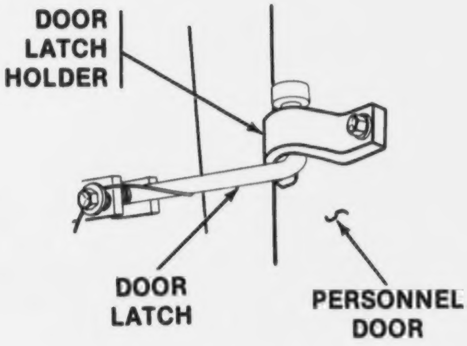
NOTE

Driver's side is shown. Personnel door, ballistic window, and blackout cover on commander's side of carrier operate same way as on driver's side.



1. OPEN AND SECURE PERSONNEL DOOR FROM OUTSIDE CARRIER.
   a. Pull outside door handle out to open personnel door.




DOOR
LATCH
HOLDER
DOOR
LATCH
PERSONNEL
DOOR

DRIVER'S SIDE

b. Pull down on door latch until it clears bottom of door latch holder.

c. Open personnel door until door latch holder lines up with door latch.

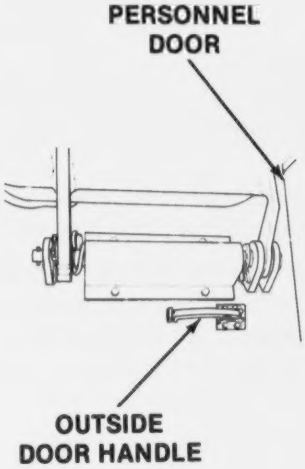
d. Release door latch. Make sure door latch fits securely in door latch holder.

2. CLOSE PERSONNEL DOOR FROM OUTSIDE CARRIER.

a. Center door latch in door latch holder and disengage door latch.

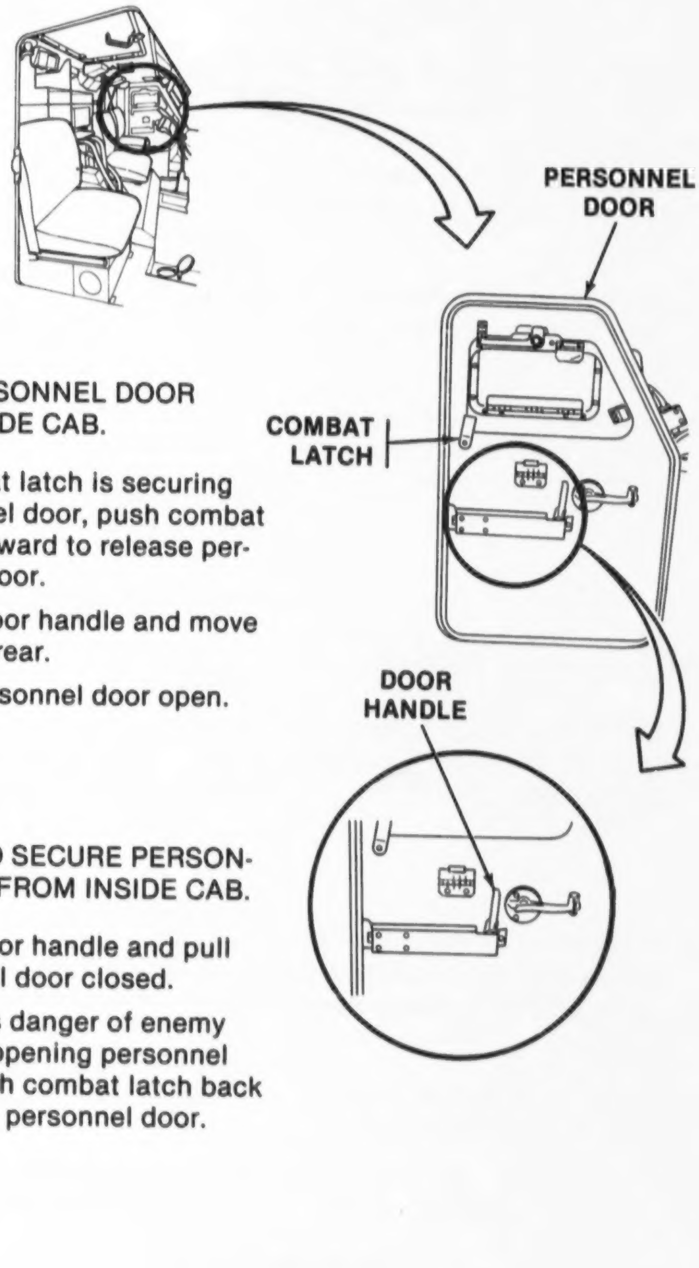
b. Push down on door latch so it clears door latch holder. Push door latch and release door latch.

c. Grasp outside door handle and close personnel door.


PERSONNEL
DOOR
OUTSIDE
DOOR HANDLE

GO TO NEXT PAGE

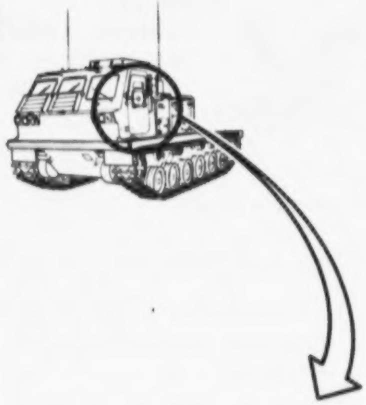
OPEN/CLOSE PERSONNEL DOORS FROM INSIDE CARRIER



3. OPEN PERSONNEL DOOR FROM INSIDE CAB.
   a. If combat latch is securing personnel door, push combat latch forward to release personnel door.
   b. Grasp door handle and move it to the rear.
   c. Push personnel door open.

4. CLOSE AND SECURE PERSONNEL DOOR FROM INSIDE CAB.
   a. Grasp door handle and pull personnel door closed.
   b. If there is danger of enemy soldiers opening personnel door, push combat latch back to secure personnel door.

CLOSE/OPEN BALLISTIC WINDOW



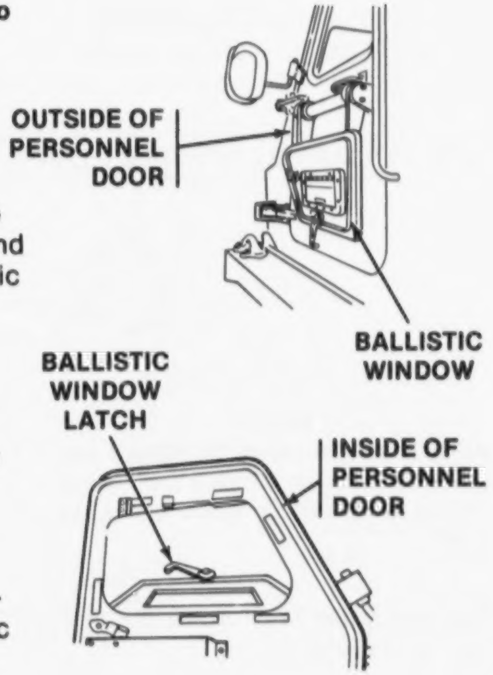
WARNING

Ballistic window can spring up and injure you. Release window slowly. Stay clear of window until window is released.

NOTE

Blackout cover must be closed to open or close ballistic window.

5. CLOSE BALLISTIC WINDOW.
   a. (C) With personnel door closed, push down on open ballistic window attached to outside of personnel door and hold until driver pulls ballistic window release handle on inside.
   b. (D) Pull ballistic window release handle.
   c. (C) Release ballistic window slowly and allow it to spring up.
   d. (D) Reach through window opening, grasp ballistic window latch, and raise ballistic window.
   e. Turn ballistic window latch and secure ballistic window.

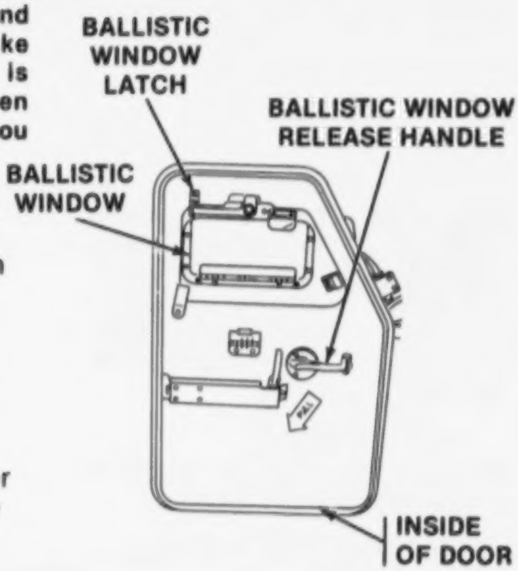

OUTSIDE OF PERSONNEL DOOR
BALLISTIC WINDOW
BALLISTIC WINDOW LATCH
INSIDE OF PERSONNEL DOOR

GO TO NEXT PAGE

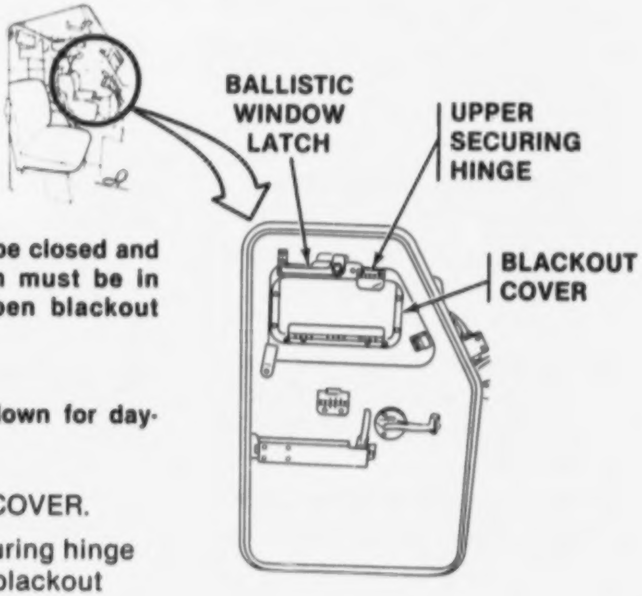
WARNING

Ballistic window can spring up and injure you. Make sure window is secure in open position before you let go of window.

6. OPEN BALLISTIC WINDOW.
   a. Pull ballistic window latch down to unlock ballistic window.
   b. (D) Pull ballistic window release handle down to unlock ballistic window.
   c. (C) Stand outside of carrier and push ballistic window down with both hands.


BALLISTIC WINDOW LATCH
BALLISTIC WINDOW RELEASE HANDLE
BALLISTIC WINDOW
INSIDE OF DOOR

OPEN/CLOSE BLACKOUT COVER


BALLISTIC WINDOW LATCH
UPPER SECURING HINGE
BLACKOUT COVER

NOTE

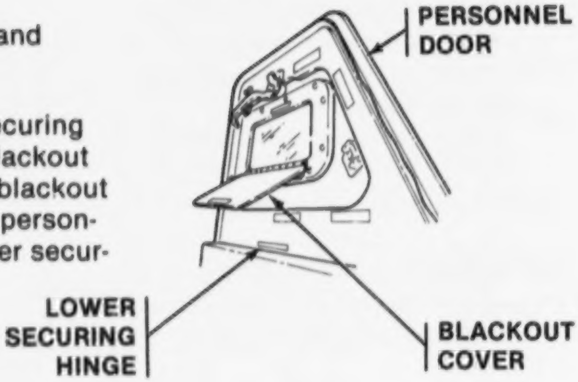
Ballistic window must be closed and ballistic window latch must be in closed position to open blackout cover.

Blackout cover folds down for daylight operations.

7. OPEN BLACKOUT COVER.
   a. Raise upper securing hinge so that it clears blackout cover.

b. Open blackout cover and hold.

c. Pull down on lower securing hinge until it clears blackout cover. Push down on blackout cover until it touches personnel door. Release lower securing hinge.

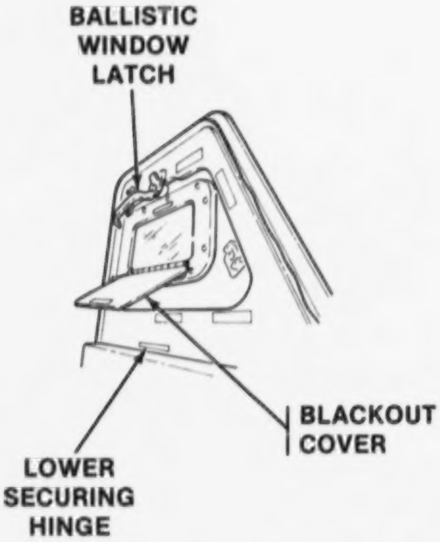

PERSONNEL DOOR
LOWER SECURING HINGE
BLACKOUT COVER

NOTE
Blackout cover must be closed to open ballistic window. Ballistic window latch must be in closed position to close blackout cover.

8. CLOSE BLACKOUT COVER.

a. Pull down on lower securing hinge until it clears blackout cover.

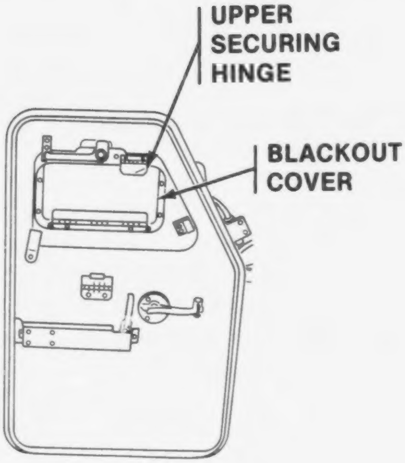
b. Pull up on blackout cover and hold. Release lower securing hinge.


BALLISTIC WINDOW LATCH
BLACKOUT COVER
LOWER SECURING HINGE

GO TO NEXT PAGE

b. Raise upper securing hinge so that it clears blackout cover, and release blackout cover. Spring tension on blackout cover will close it.

c. Release upper securing hinge. Upper securing hinge will hold blackout cover.

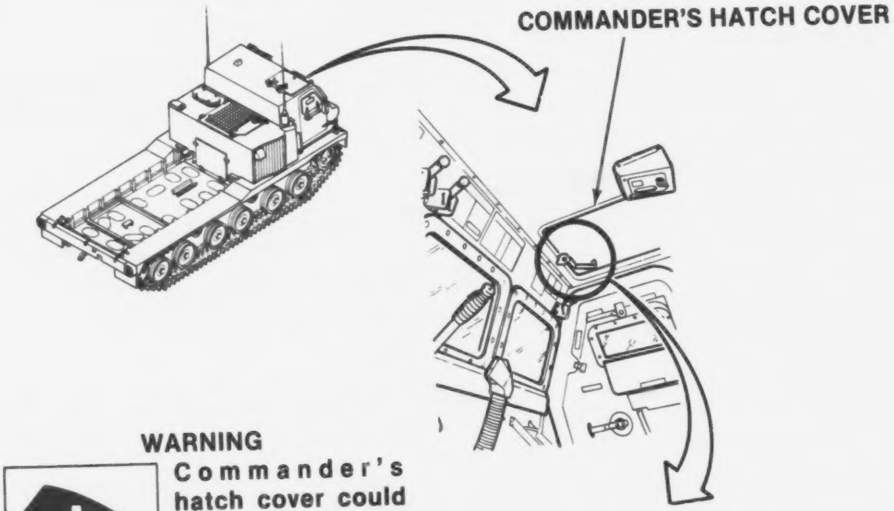

UPPER SECURING HINGE
BLACKOUT COVER

END OF TASK

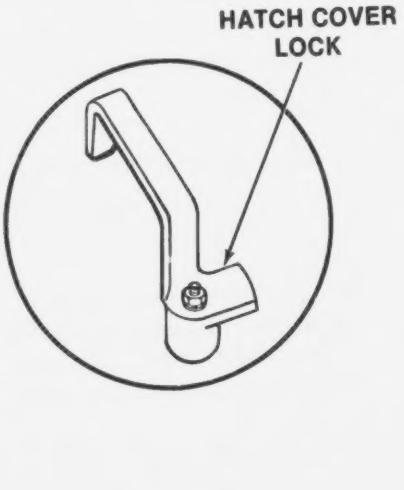
OPEN/CLOSE COMMANDER'S HATCH COVER

INITIAL SETUP

Personnel Required:	Equipment Conditions:
Commander	Carrier parked Hand brake set (page 2-167)



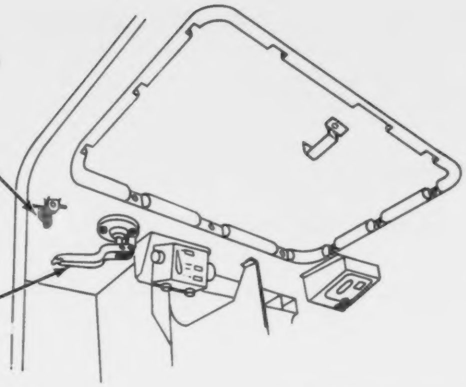
WARNING
Commander's hatch cover could fall and injure you. Keep hands clear when you open or close commander's hatch cover.



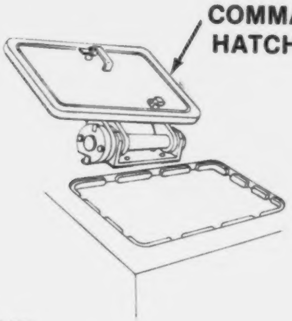
1. OPEN COMMANDER'S HATCH COVER FROM CLOSED TO POP-UP POSITION.
   a. Pull hatch cover lock to unlock position. Make sure commander's hatch cover is secure in POP-UP position.

GO TO NEXT PAGE

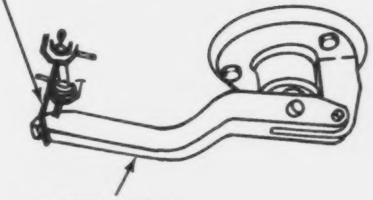
b. Push on safety latch and secure safety latch with safety clip.


SAFETY CLIP
SAFETY LATCH

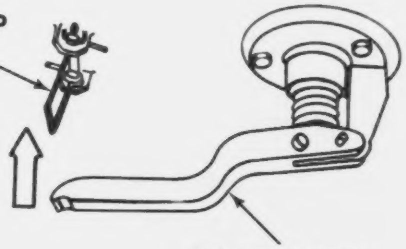
2. OPEN COMMANDER'S HATCH COVER FROM POP-UP TO OPEN POSITION.


COMMANDER'S HATCH COVER

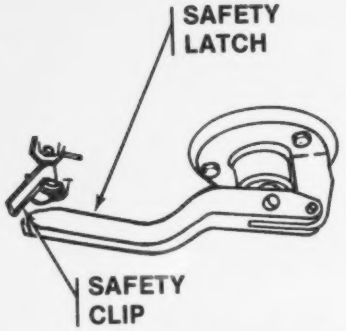
a. Release safety clip.
b. Pull safety latch down and hold. Then push commander's hatch cover to OPEN position. Release safety latch.

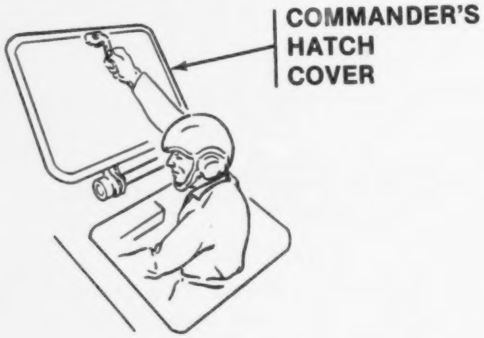

SAFETY CLIP
SAFETY LATCH

c. Check that commander's hatch cover is secured to top of cab. Push safety latch up and secure with safety clip.

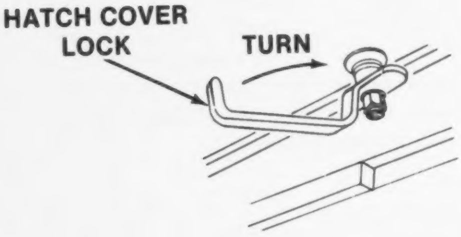

SAFETY CLIP
SAFETY LATCH

3. CLOSE COMMANDER'S HATCH COVER FROM OPEN OR POP-UP POSITION.
   a. Release safety clip.
   b. Pull safety latch down and hold.


SAFETY LATCH
SAFETY CLIP


COMMANDER'S HATCH COVER

   c. Pull commander's hatch cover to CLOSED position with handle.


HATCH COVER LOCK
TURN

   d. Release safety latch. Turn hatch cover lock to secure commander's hatch cover.

END OF TASK

OPERATE LOUVERS

DESCRIPTION

This task covers: Operate Driver's Louver (page 2-104). Operate Commander's/Gunner's Louver (page 2-107).

INITIAL SETUP

Personnel Required:

Driver (D)
Commander (C)

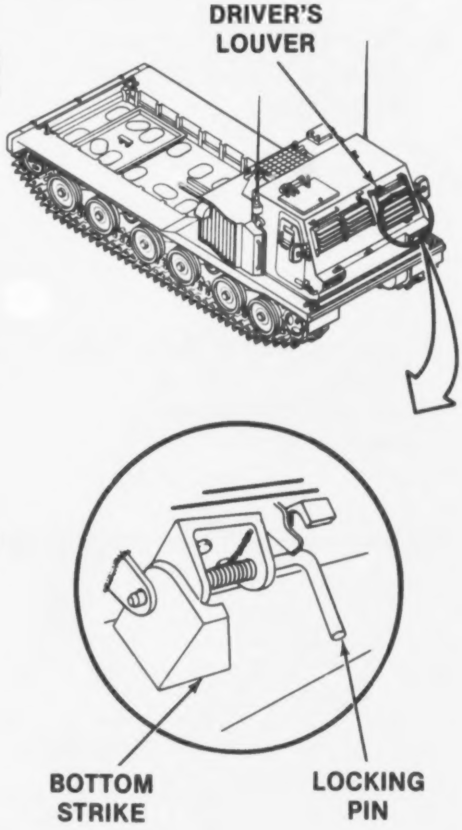
Equipment Conditions:

Hand brake set (page 2-167)

OPERATE DRIVER'S LOUVER

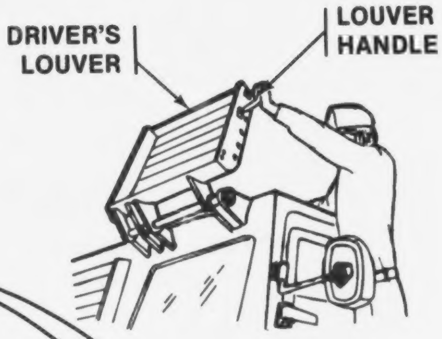
WARNING

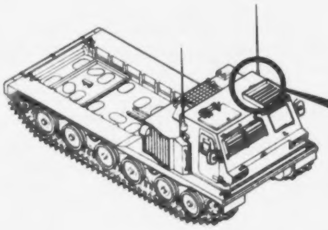
Louvers can swing down and kill or injure you when you raise cab. Make sure locking pin secures louvers in stowed positions before you raise cab. Stay clear of louvers when cab is being raised.

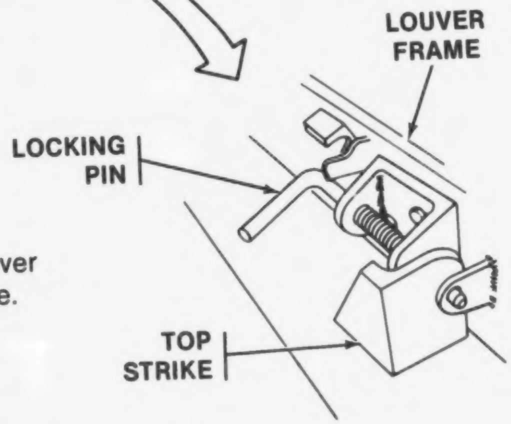


1. (D) MOVE DRIVER'S LOUVER TO UPPER STOWED POSITION.
   a. Pull out locking pin from bottom strike.

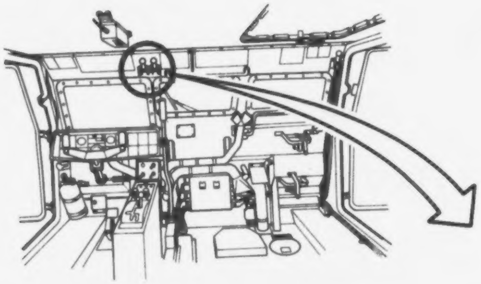
b. Grasp louver handle, and pull driver's louver to upper stowed position.

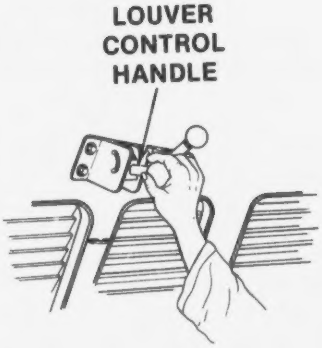

DRIVER'S LOUVER
LOUVER HANDLE




LOUVER FRAME
LOCKING PIN
TOP STRIKE

c. Push locking pin on louver frame through top strike.



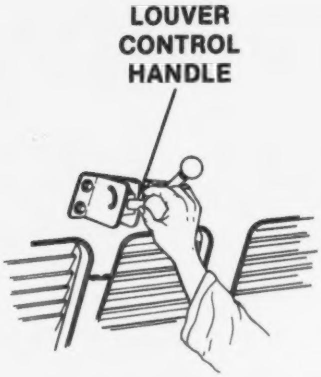

LOUVER CONTROL HANDLE

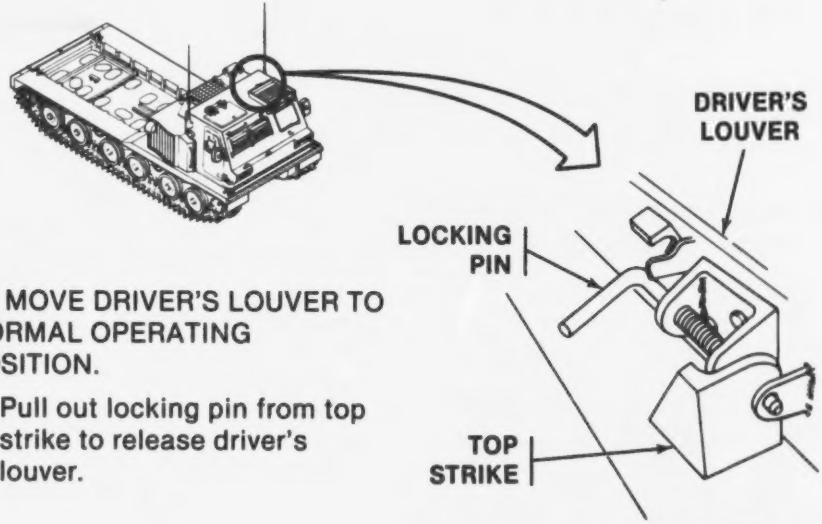
2. (D) OPEN DRIVER'S LOUVER.

   a. Push in and move louver control handle up until louver control handle locks in detent.

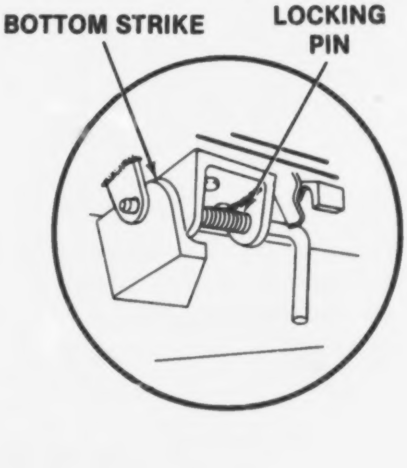
GO TO NEXT PAGE

3. (D) CLOSE DRIVER'S LOUVER.
   a. Push in and pull down louver control handle until louver control handle locks in detent.


LOUVER
CONTROL
HANDLE


DRIVER'S
LOUVER
LOCKING
PIN
TOP
STRIKE

4. (D) MOVE DRIVER'S LOUVER TO NORMAL OPERATING POSITION.
   a. Pull out locking pin from top strike to release driver's louver.
   b. Push down on driver's louver until bottom strike and locking pin are alined.

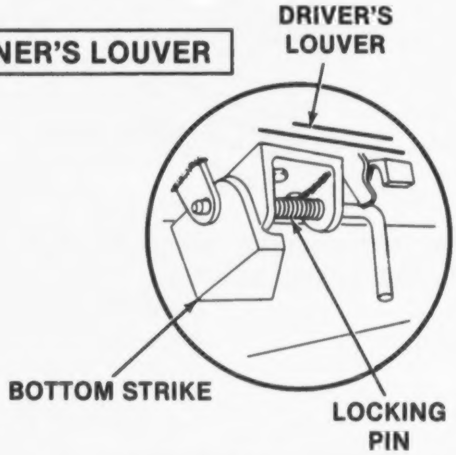

BOTTOM STRIKE
LOCKING
PIN

c. Push locking pin into bottom strike and secure driver's louver in normal operating position.

OPERATE COMMANDER'S/GUNNER'S LOUVER

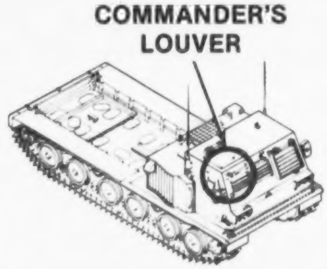
WARNING

Louvers can swing out and kill or injure you when you raise cab. Make sure locking pin secures louvers in stowed positions before you raise cab. Stay clear of louvers when cab is being raised.


DRIVER'S LOUVER
BOTTOM STRIKE
LOCKING PIN

CAUTION

Windshield wipers can get damaged if commander's and gunner's louvers are open when you lower or stow louvers. Close commander's and gunner's louvers before lowering or stowing louvers.

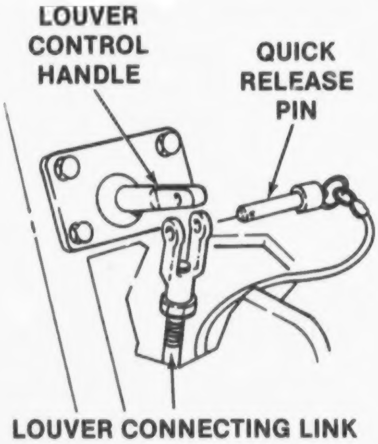

COMMANDER'S LOUVER

NOTE

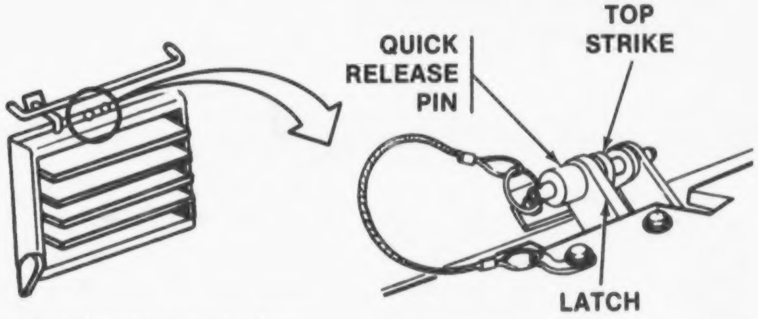
Operation of commander's and gunner's louvers are the same. Commander's louver is shown here.

5. (C) MOVE COMMANDER'S LOUVER TO STOWED POSITION.

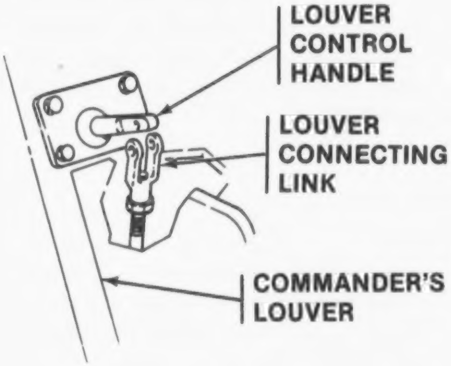
   a. Remove quick release pin from louver connecting link and louver control handle.


LOUVER CONTROL HANDLE
QUICK RELEASE PIN
LOUVER CONNECTING LINK

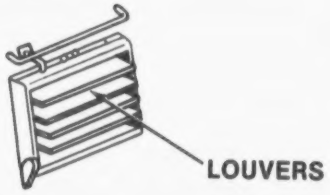
GO TO NEXT PAGE


QUICK RELEASE PIN
TOP STRIKE
LATCH

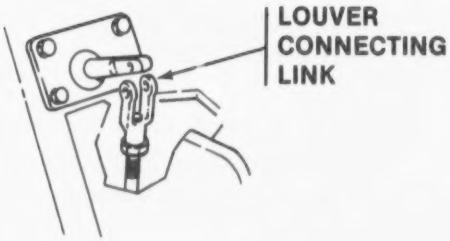
b. Remove quick release pin from top strike and latch.


LOUVER CONTROL HANDLE
LOUVER CONNECTING LINK
COMMANDER'S LOUVER

c. Tilt back commander's louver until louver connecting link clears louver control handle.

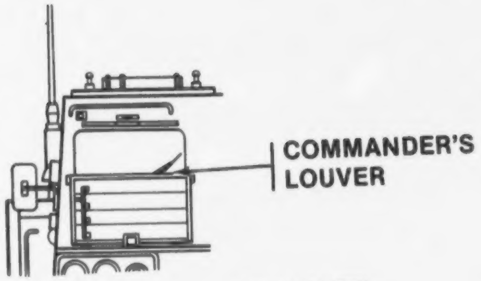


d. Push down on louvers.

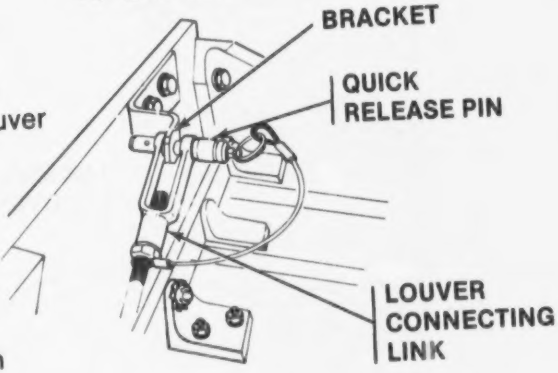

LOUVER CONNECTING LINK

e. Pull up on louver connecting link.

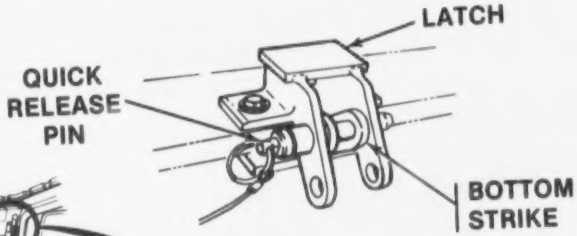
f. Move commander's louver to lowered stowed position.

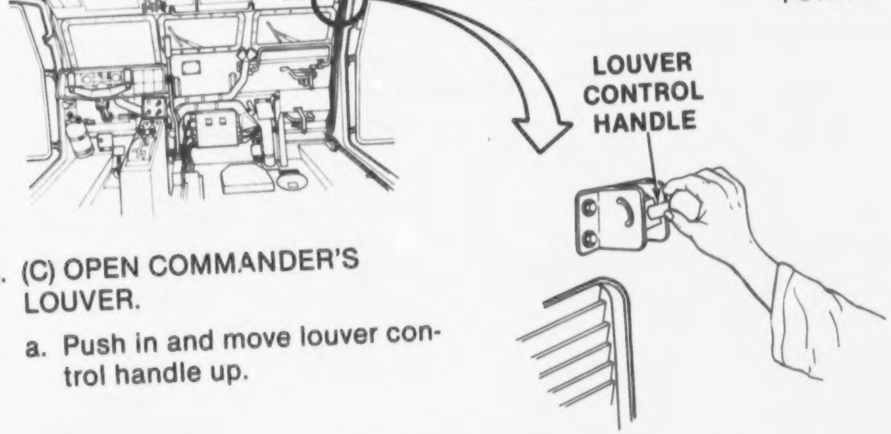

COMMANDER'S LOUVER

g. Push quick release pin through bracket and louver connecting link.


BRACKET
QUICK RELEASE PIN
LOUVER CONNECTING LINK

h. Push quick release pin through bottom strike and latch.


LATCH
QUICK RELEASE PIN
BOTTOM STRIKE


LOUVER CONTROL HANDLE

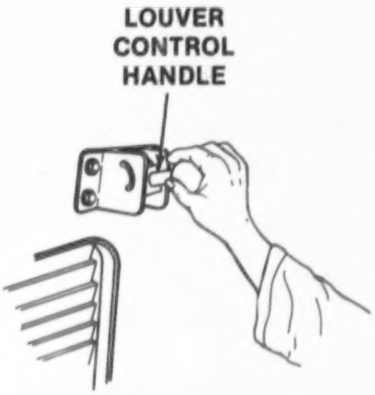
6. (C) OPEN COMMANDER'S LOUVER.

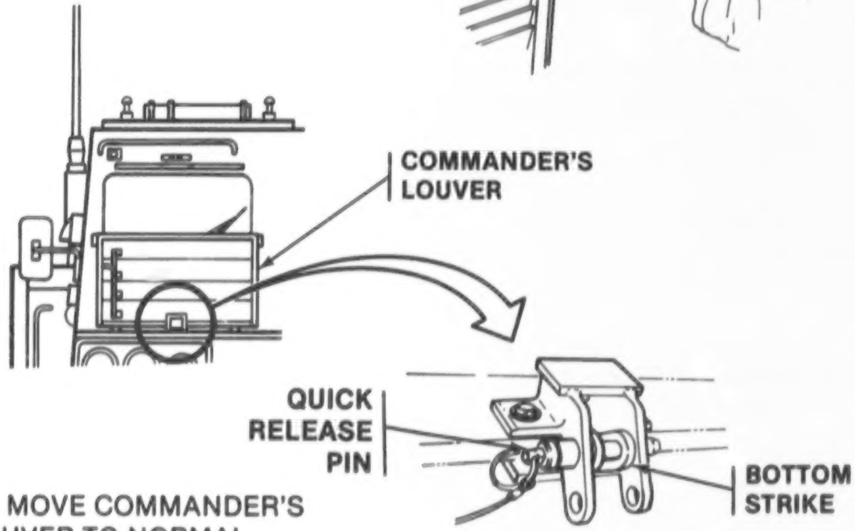
   a. Push in and move louver control handle up.

GO TO NEXT PAGE

7. (C) CLOSE COMMANDER'S LOUVER.

   a. Push in and move louver control handle down.

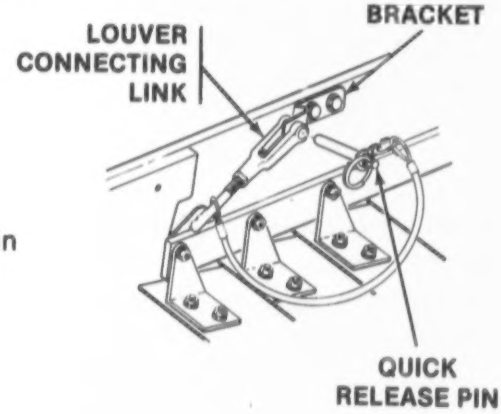

LOUVER
CONTROL
HANDLE


COMMANDER'S
LOUVER
QUICK
RELEASE
PIN
BOTTOM
STRIKE

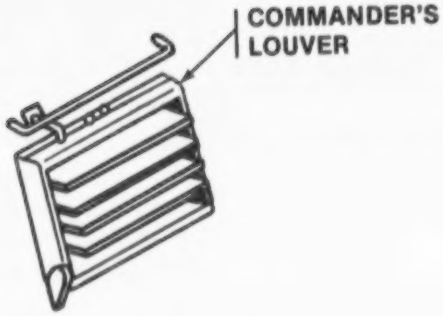
8. (C) MOVE COMMANDER'S LOUVER TO NORMAL OPERATING POSITION.

   a. Pull out quick release pin from bottom strike.

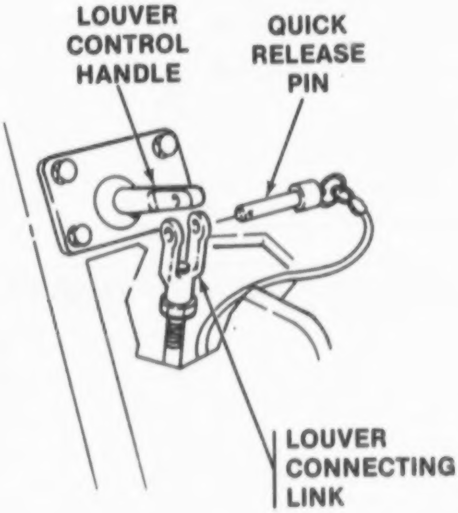
   b. Pull out quick release pin from bracket and louver connecting link.


LOUVER
CONNECTING
LINK
BRACKET
QUICK
RELEASE PIN

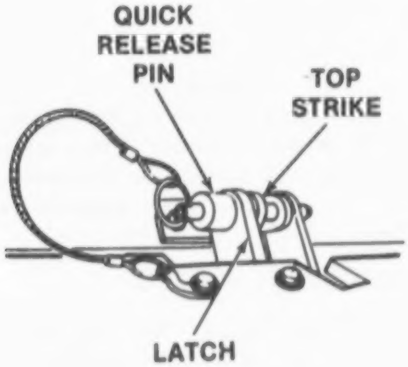
c. Pull up commander's louver to normal operating position.


COMMANDER'S LOUVER

d. Insert quick release pin through louver connecting link and louver control handle.


LOUVER CONTROL HANDLE
QUICK RELEASE PIN
LOUVER CONNECTING LINK

e. Insert quick release pin through latch and top strike.


QUICK RELEASE PIN
TOP STRIKE
LATCH

END OF TASK

OPERATE SEATS

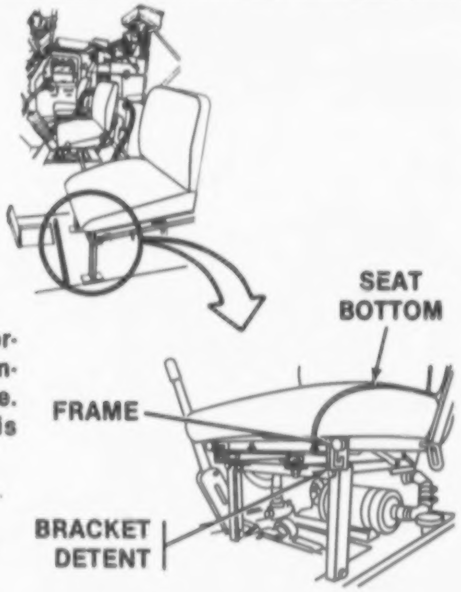
DESCRIPTION

This task covers: Adjust Driver's/Gunner's/Commander's Seat Bottom (page 2-112). Adjust Driver's/Gunner's/Commander's Seat Backrest (page 2-114). Adjust Driver's Seat (page 2-115). Move Gunner's Seat (page 2-116). Move Commander's Seat Bottom (page 2-117).

INITIAL SETUP

Personnel Required:	Equipment Conditions:
Driver Gunner Commander	Engine stopped (page 2-167)

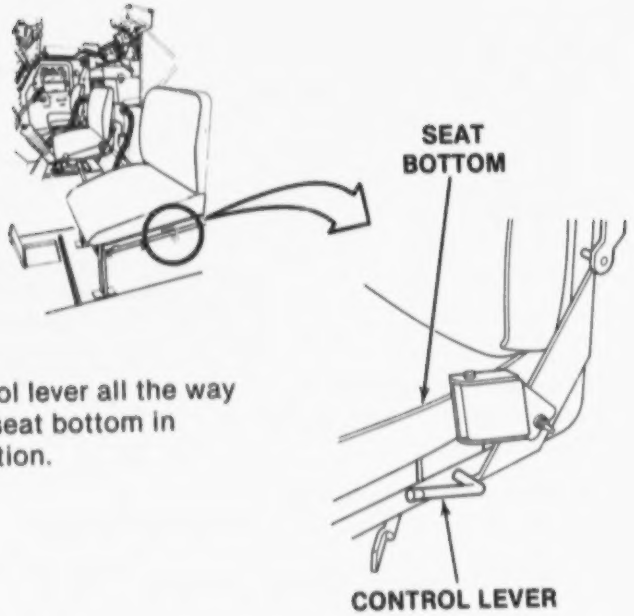
ADJUST DRIVER'S/GUNNER'S/COMMANDER'S SEAT BOTTOM



NOTE

The procedure for raising and lowering the driver's, gunner's, and commander's seat bottom is the same. Only the driver's seat bottom is shown.

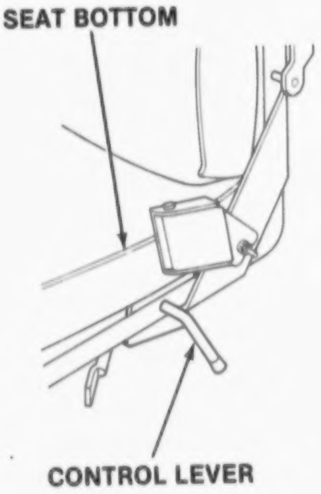
1. RAISE SEAT BOTTOM.
   a. Lift up front of seat bottom until pin in frame locks in bracket detent.


SEAT BOTTOM
CONTROL LEVER

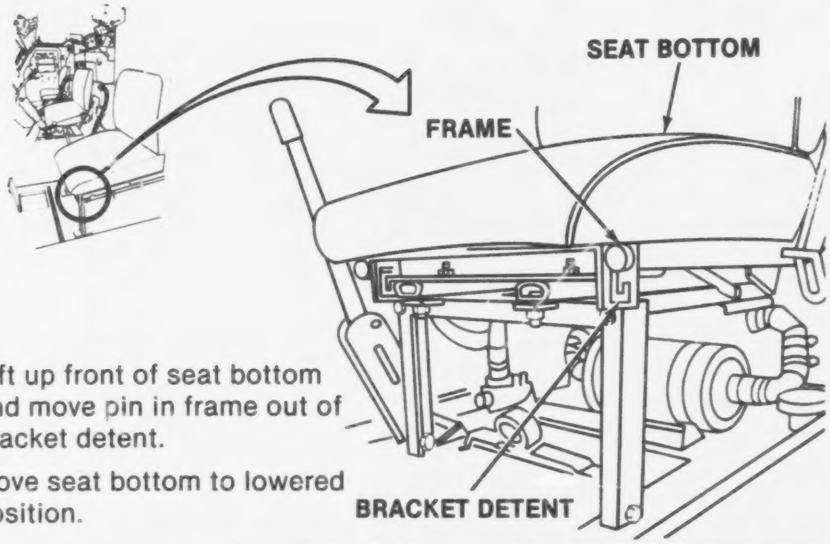
b. Move control lever all the way up to lock seat bottom in raised position.

2. LOWER SEAT BOTTOM.

   a. Move control lever to down position.


SEAT BOTTOM
CONTROL LEVER

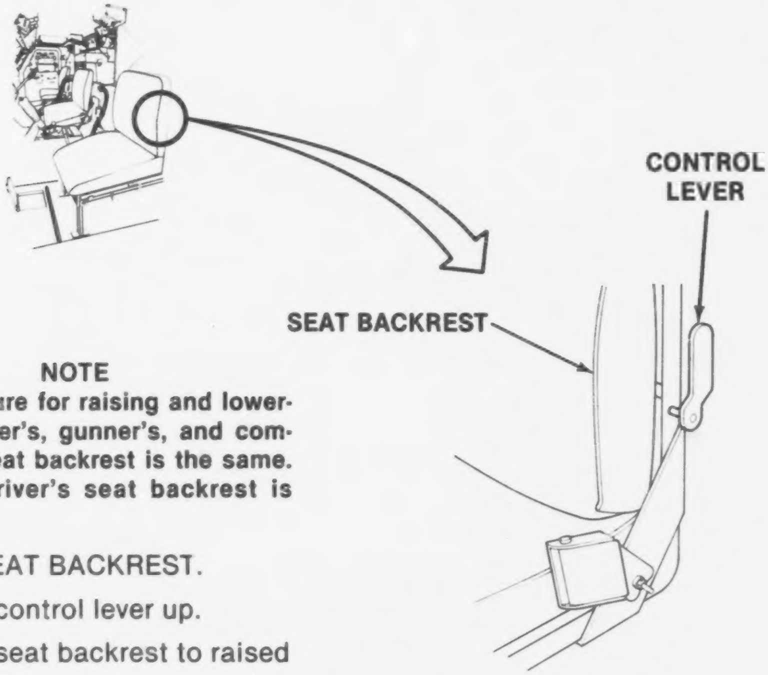
GO TO NEXT PAGE


SEAT BOTTOM
FRAME
BRACKET DETENT

b. Lift up front of seat bottom and move pin in frame out of bracket detent.

c. Move seat bottom to lowered position.

ADJUST DRIVER'S/GUNNER'S/COMMANDER'S SEAT BACKREST


CONTROL LEVER
SEAT BACKREST

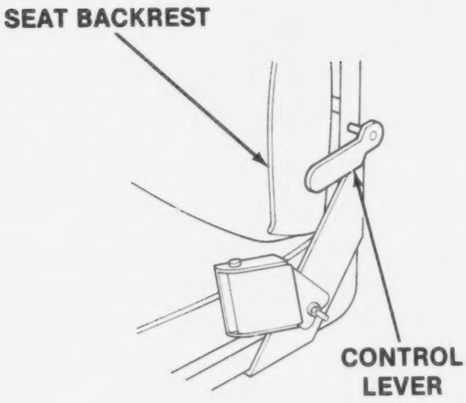
NOTE

The procedure for raising and lowering the driver's, gunner's, and commander's seat backrest is the same. Only the driver's seat backrest is shown.

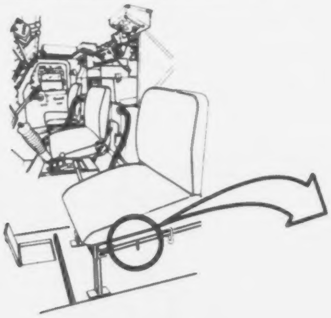
3. RAISE SEAT BACKREST.
   a. Move control lever up.
   b. Move seat backrest to raised position.

GO TO NEXT PAGE

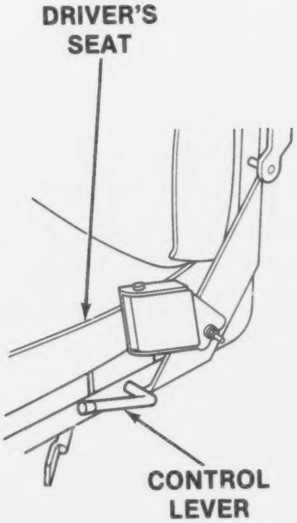
4. LOWER SEAT BACKREST.
   a. Move seat backrest to lowered position.
   b. Move control lever down.


SEAT BACKREST
CONTROL LEVER

ADJUST DRIVER'S SEAT

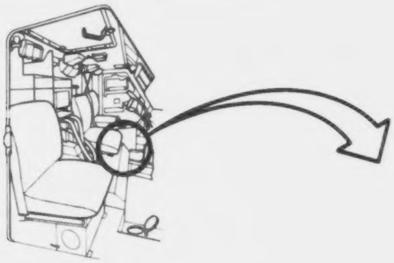


5. MOVE DRIVER'S SEAT TO FRONT OR REAR.
   a. Pull out control lever and move driver's seat to front or rear.
   b. Release control lever.

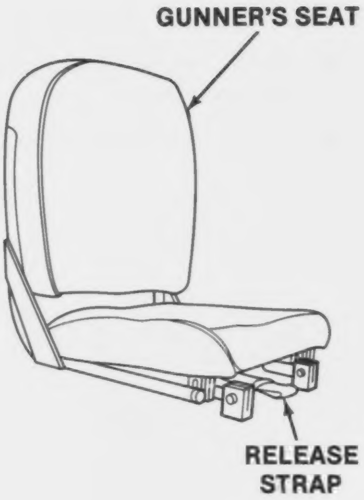

DRIVER'S SEAT
CONTROL LEVER

GO TO NEXT PAGE

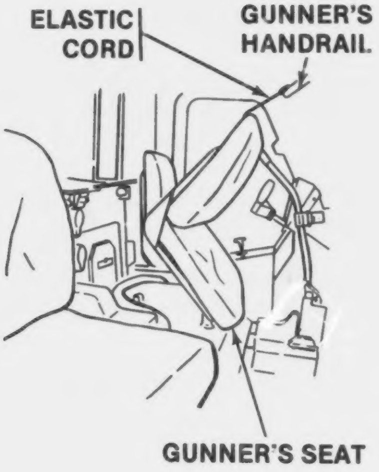
MOVE GUNNER'S SEAT



6. TILT GUNNER'S SEAT FORWARD.
   a. Pull release strap forward with quick, hard pull.
   b. Tilt gunner's seat forward.
   c. Hook elastic cord on gunner's handrail.

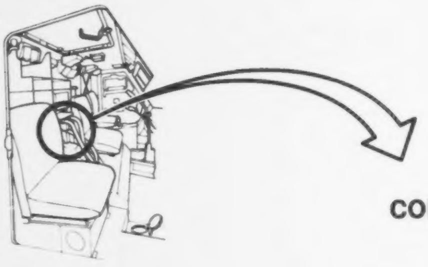

GUNNER'S SEAT
RELEASE STRAP

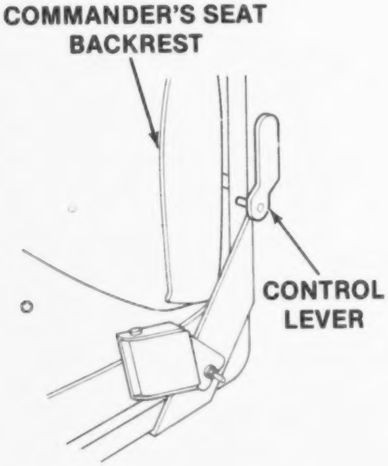
7. LOWER GUNNER'S SEAT.
   a. Unhook elastic cord from gunner's handrail.
   b. Lower gunner's seat until latched.


ELASTIC CORD
GUNNER'S HANDRAIL
GUNNER'S SEAT

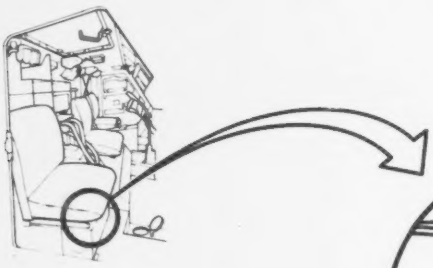
GO TO NEXT PAGE

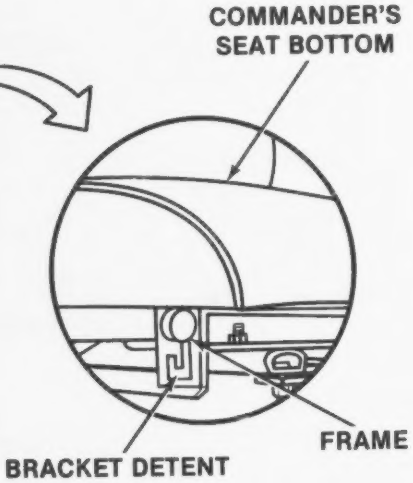
MOVE COMMANDER'S SEAT BOTTOM




COMMANDER'S SEAT BACKREST
CONTROL LEVER

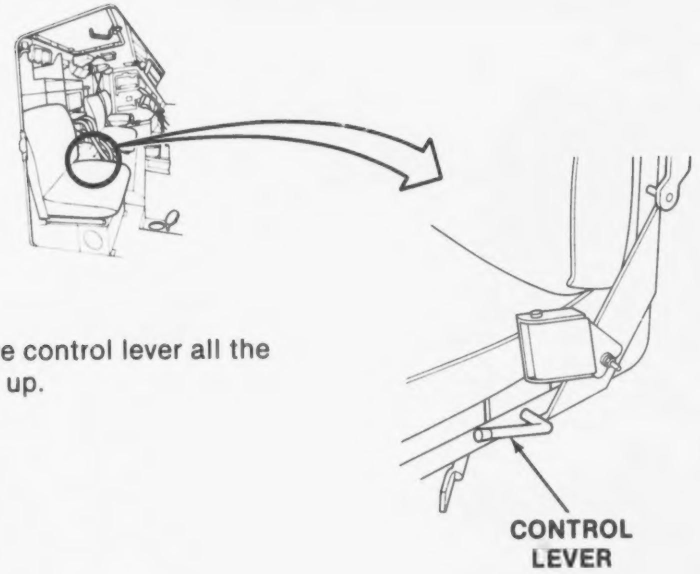
8. RAISE COMMANDER'S SEAT BACKREST.
   a. Move control lever up.
   b. Move commander's seat backrest to raised position.



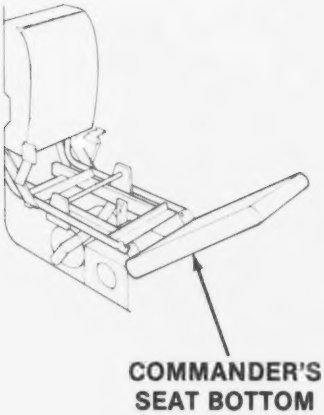

COMMANDER'S SEAT BOTTOM
FRAME
BRACKET DETENT

9. TILT COMMANDER'S SEAT BOTTOM FORWARD.
   a. Lift up front of commander's seat bottom until pin in frame is in bracket detent.

GO TO NEXT PAGE


CONTROL
LEVER

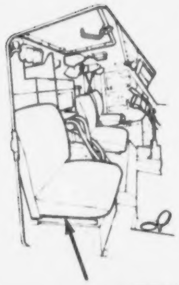
b. Move control lever all the way up.


COMMANDER'S
SEAT BOTTOM

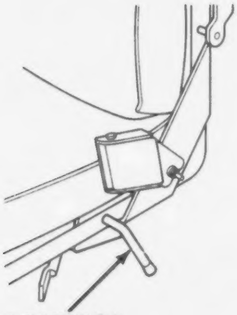
c. Lift up on rear of commander's seat bottom and tilt commander's seat bottom forward.

10. LOWER COMMANDER'S SEAT BOTTOM.

   a. Lower commander's seat bottom.

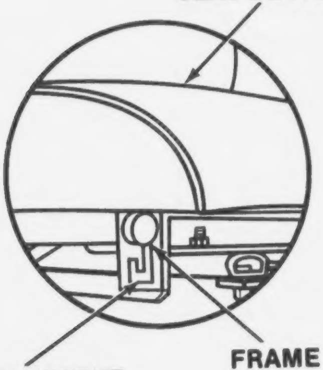

COMMANDER'S SEAT BOTTOM

   b. Move control lever to down position.

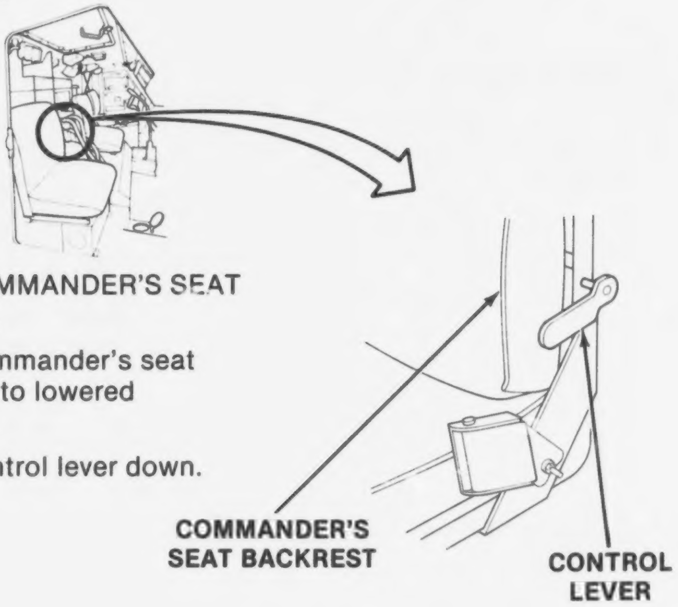

CONTROL LEVER

   c. Lift up on front of commander's seat bottom and move pin in frame out of bracket detent.

   d. Move commander's seat bottom to lowered position.


COMMANDER'S SEAT BOTTOM
BRACKET DETENT
FRAME

GO TO NEXT PAGE


COMMANDER'S
SEAT BACKREST
CONTROL
LEVER

11. LOWER COMMANDER'S SEAT BACKREST.

    a. Move commander's seat backrest to lowered position.

    b. Move control lever down.

END OF TASK

OPERATE INTERCOM SYSTEM

INITIAL SETUP

Personnel Required:

Driver
Soldier

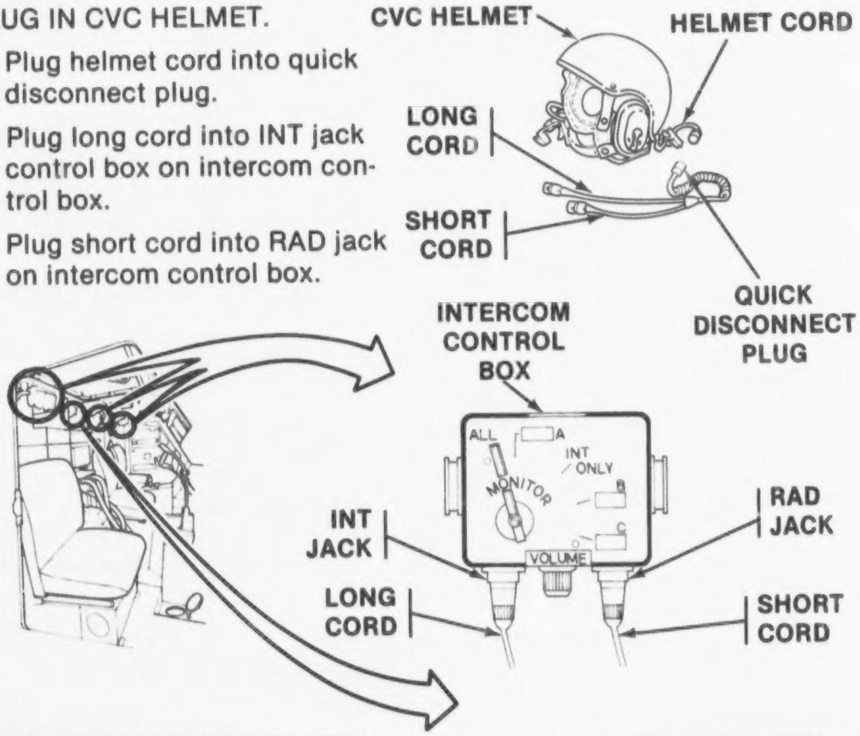
References:

TM 11-5820-401-10-1

Equipment Conditions:

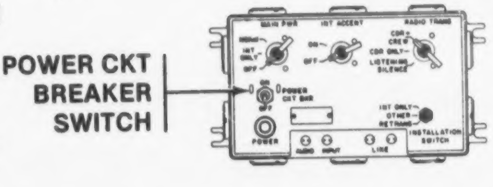
MASTER POWER switch at ACCESS ON or ENGINE ON (page 2-2)
RADIO POWER switch ON (TM 11-5820-401-10-1)

1. PLUG IN CVC HELMET.
   a. Plug helmet cord into quick disconnect plug.
   b. Plug long cord into INT jack control box on intercom control box.
   c. Plug short cord into RAD jack on intercom control box.

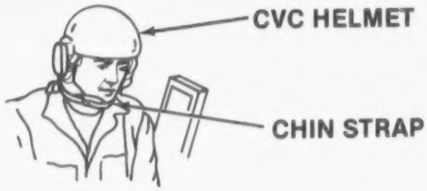

CVC HELMET
HELMET CORD
LONG CORD
SHORT CORD
QUICK DISCONNECT PLUG
INTERCOM CONTROL BOX
ALL
A
INT / ONLY
MONITOR
B
C
VOLUME
INT JACK
RAD JACK
LONG CORD
SHORT CORD

2. MOVE RADIO POWER SWITCH TO LOW OR HIGH. See TM 11-5820-401-10-1.

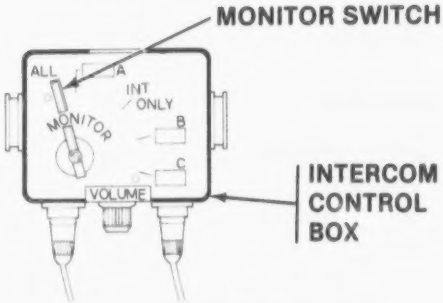
3. MOVE POWER CKT BREAKER SWITCH TO ON.


POWER CKT BREAKER SWITCH
MAIN PWR
INT ACCENT
RADIO TRANS
ON
OFF
POWER CKT BKR
POWER
LINE
INSTALLATION SWITCH

GO TO NEXT PAGE


CVC HELMET
CHIN STRAP

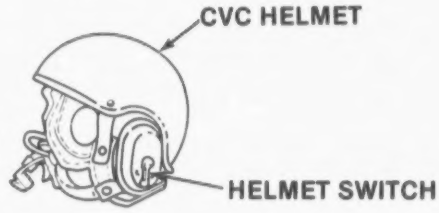
4. PUT ON CVC HELMET.
   a. Install earplugs.
   b. Place CVC helmet on head.
   c. Adjust chin strap as needed.


MONITOR SWITCH
ALL
A
INT
ONLY
MONITOR
B
C
VOLUME
INTERCOM
CONTROL
BOX

NOTE

ALL position operates radios and intercom. INT ONLY position operates only intercom. ALL position allows you to talk to another carrier.

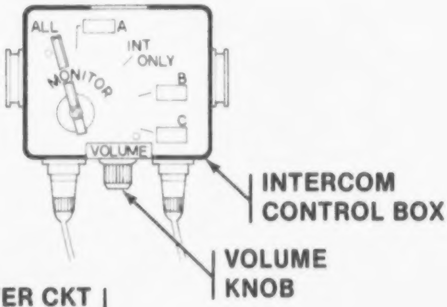
5. SELECT CHANNEL ON INTERCOM CONTROL BOX.
   a. Move MONITOR switch to ALL or INT ONLY.


CVC HELMET
HELMET SWITCH

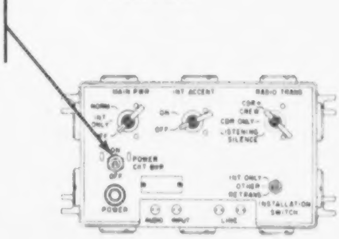
NOTE

Soldiers can talk and listen when helmet switch on left of CVC helmet is moved to rear.

6. MOVE HELMET SWITCH ON LEFT OF CVC HELMET TO REAR.


ALL
A
INT
ONLY
MONITOR
B
C
VOLUME
INTERCOM
CONTROL BOX
VOLUME
KNOB

7. ADJUST VOLUME KNOB ON INTERCOM CONTROL BOX.


POWER CKT
BREAKER
SWITCH
MAIN PWR
INT ACCENT
RADIO TRANS
NORM
INT ONLY
OFF
ON
OFF
CDR + CREW
CDR ONLY
LISTENING SILENCE
ON
POWER
CKT BKR
OFF
POWER
INT ONLY
OTHER
RETRANS
INSTALLATION
SWITCH
AUDIO
INPUT
LINE

8. MOVE POWER CKT BREAKER SWITCH TO OFF.

9. MOVE RADIO POWER SWITCH TO OFF. See TM 11-5820-401-10-1.

END OF TASK

START ENGINE/WARM UP TRANSMISSION

DESCRIPTION

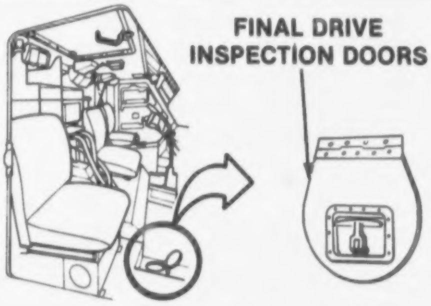
This task covers: Prepare to Start Engine (page 2-123). Start Engine Above 40°F (+ 4°C) (page 2-128). Start Engine Below +40°F (+4°C) (page 2-130).

INITIAL SETUP

Personnel Required:	Equipment Conditions:
Driver	Engine stopped (page 2-167)

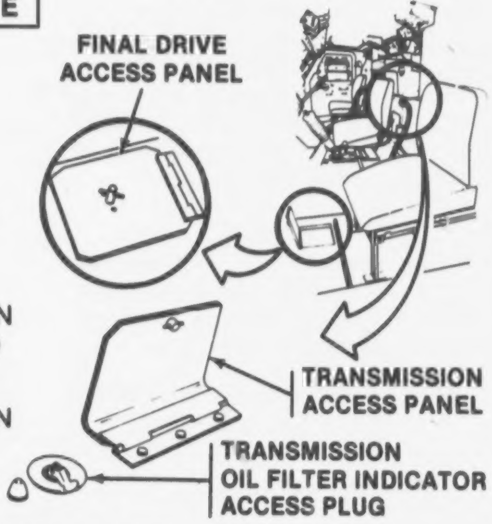
WARNING

Engine exhaust gas is deadly poison. Make sure final drive inspection doors and transmission access panel are closed tightly before you start engine.


FINAL DRIVE
INSPECTION DOORS

PREPARE TO START ENGINE

1. CHECK THAT FINAL DRIVE INSPECTION DOORS ARE SECURED AND LATCHED TIGHTLY.
2. RAISE GUNNER'S SEAT. See task: OPERATE SEATS, page 2-112.
3. CHECK THAT TRANSMISSION ACCESS PANEL IS SECURED AND LATCHED TIGHTLY.
4. CHECK THAT TRANSMISSION OIL FILTER INDICATOR ACCESS PLUG IS IN PLACE AND SECURE.


FINAL DRIVE
ACCESS PANEL
TRANSMISSION
ACCESS PANEL
TRANSMISSION
OIL FILTER INDICATOR
ACCESS PLUG

GO TO NEXT PAGE

5. CHECK THAT PERSONNEL DOORS ARE CLOSED AND SECURED. See task: OPEN/CLOSE PERSONNEL DOORS AND DOOR ASSEMBLIES, page 2-94.

6. CHECK THAT COMMANDER'S HATCH COVER IS SECURED. See task: OPEN/CLOSE COMMANDER'S HATCH COVER, page 2-101.

WARNING

Rapid starts, sudden stops and sharp turns can injure soldiers. Soldiers must sit inside carrier on seats and secure seat belts.

7. FASTEN LAP SAFETY BELT AND SHOULDER HARNESS.

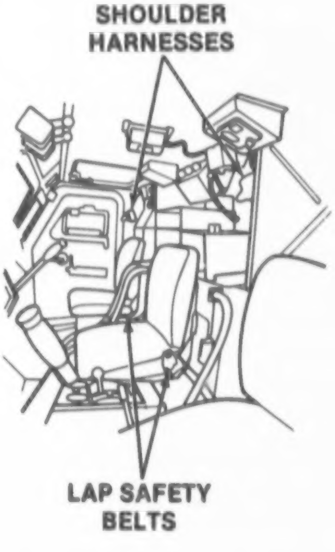
WARNING

Noise levels in carrier could damage hearing. Wear ear protection. Read warning in front of this manual.

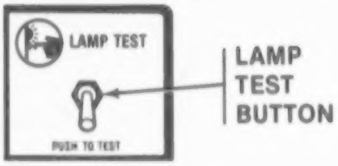
CAUTION

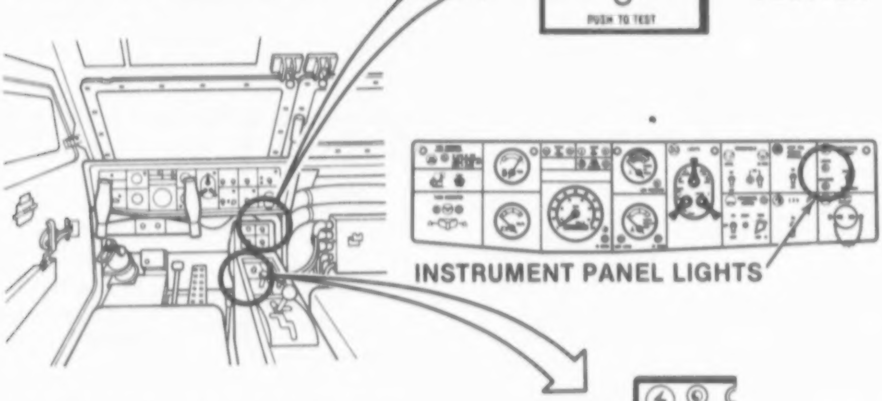
During engine start, damage to radio components can occur. Make sure that radio power switch is off before starting engine.

8. PUT IN EAR PLUGS. PUT ON AND PLUG IN CVC HELMET. See task: OPERATE INTERCOM SYSTEM, page 2-121.

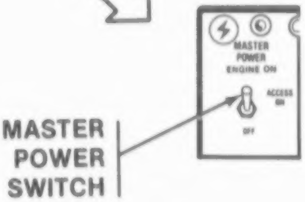


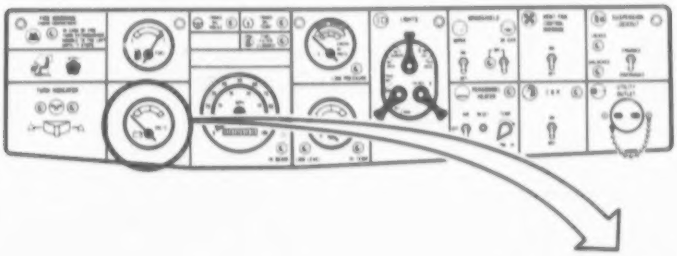
9. MOVE MASTER POWER SWITCH TO ENGINE ON.


LAMP TEST
PUSH TO TEST
LAMP TEST BUTTON


INSTRUMENT PANEL LIGHTS

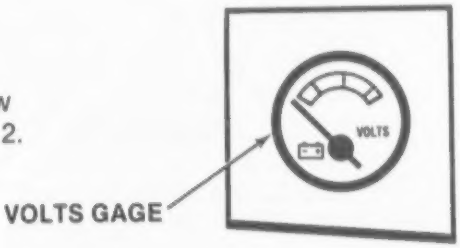
10. PRESS AND HOLD LAMP TEST BUTTON. CHECK THAT ALL INSTRUMENT PANEL LIGHTS COME ON AND THAT WARNING TONE SOUNDS.


MASTER POWER ENGINE ON
ACCESS ON
OFF
MASTER POWER SWITCH

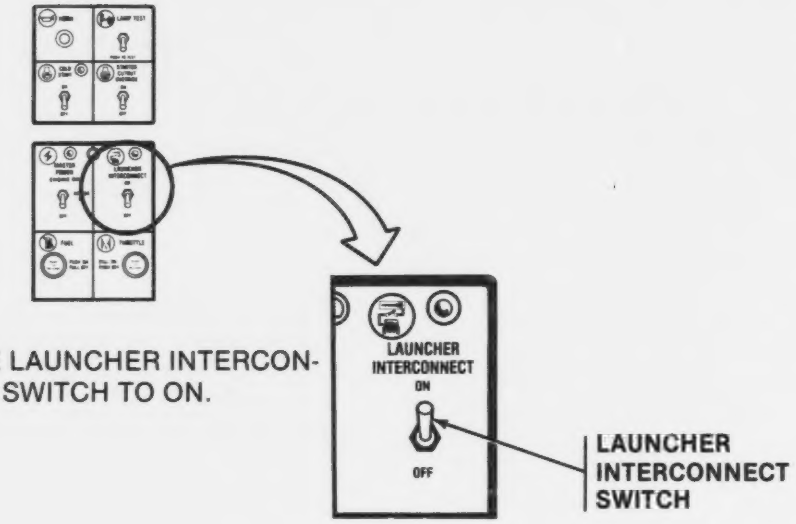


11. CHECK VOLTS GAGE.

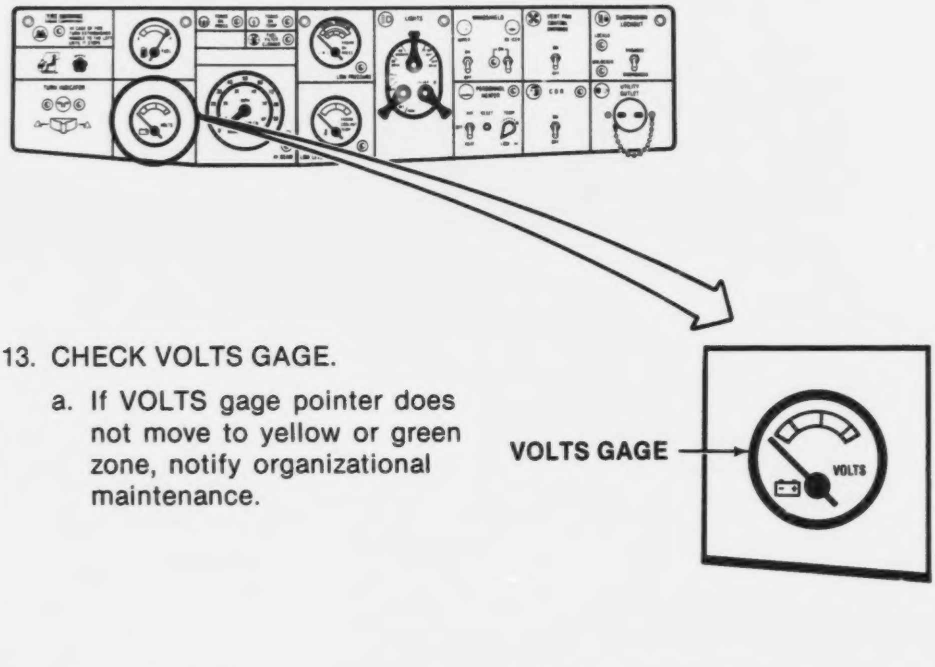
a. If volts gage goes to yellow or green zone, go to step 12.


VOLTS
VOLTS GAGE

GO TO NEXT PAGE


LAUNCHER
INTERCONNECT
ON
OFF
LAUNCHER
INTERCONNECT
SWITCH

12. MOVE LAUNCHER INTERCONNECT SWITCH TO ON.


VOLTS GAGE
VOLTS

13. CHECK VOLTS GAGE.

    a. If VOLTS gage pointer does not move to yellow or green zone, notify organizational maintenance.

best copy available

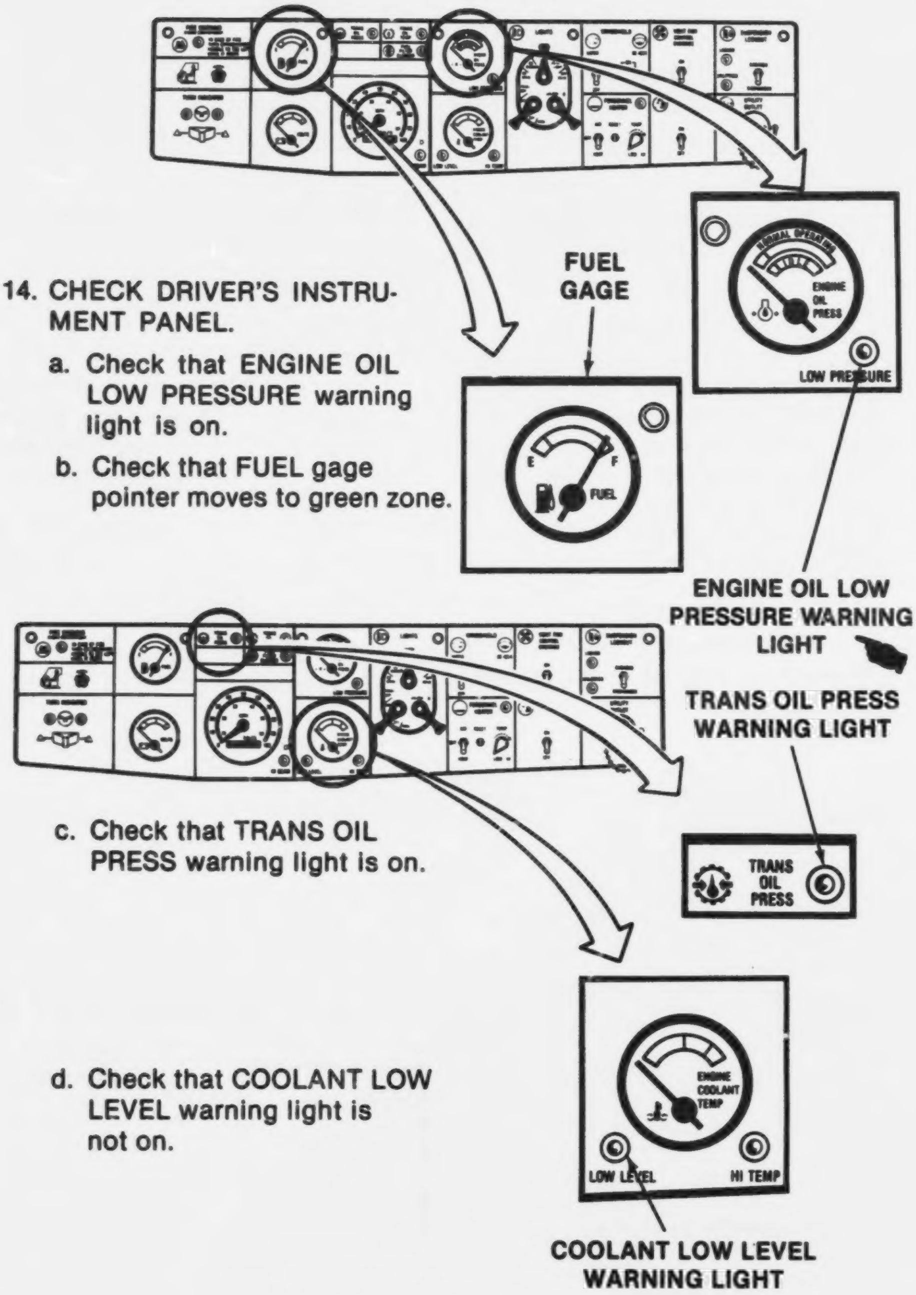
14. CHECK DRIVER'S INSTRUMENT PANEL.

a. Check that ENGINE OIL LOW PRESSURE warning light is on.

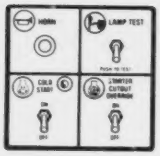
b. Check that FUEL gage pointer moves to green zone.

c. Check that TRANS OIL PRESS warning light is on.

d. Check that COOLANT LOW LEVEL warning light is not on.


FUEL GAGE
E
F
FUEL
NORMAL OPERATING
ENGINE OIL PRESS
LOW PRESSURE
ENGINE OIL LOW PRESSURE WARNING LIGHT
TRANS OIL PRESS WARNING LIGHT
TRANS OIL PRESS
ENGINE COOLANT TEMP
LOW LEVEL
HI TEMP
COOLANT LOW LEVEL WARNING LIGHT

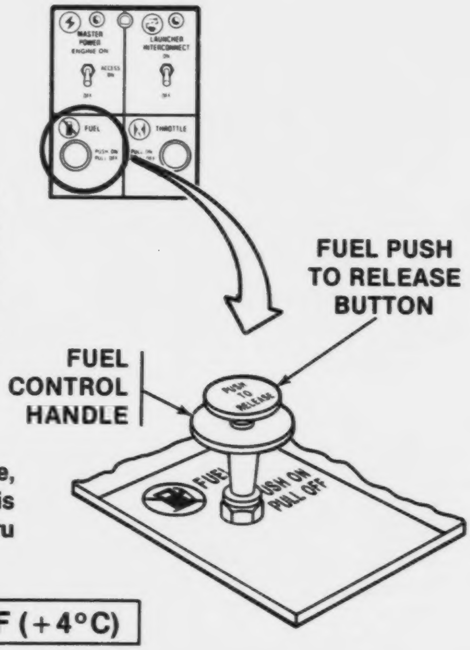
GO TO NEXT PAGE


HORN
LAMP TEST
PUSH TO TEST
COLD START
STARTER CUTOUT OVERRIDE
ON
OFF

15. TURN ON FUEL CONTROL.
    a. Press and hold FUEL PUSH TO RELEASE button.
    b. Push in FUEL control handle.
    c. Release FUEL PUSH TO RELEASE button to lock FUEL control handle.

CAUTION

Engine can be damaged if allowed to idle for more than 15 minutes at coolant temperatures below 1/3 into green zone of coolant gage. Perform extended engine idle warm-up procedure if necessary to keep coolant temperature above 1/3 of green zone.


MASTER POWER ENGINE ON
ACCESS ON
LAUNCHER INTERCONNECT
ON
OFF
FUEL
PUSH ON PULL OFF
THROTTLE
FUEL PUSH TO RELEASE BUTTON
FUEL CONTROL HANDLE
PUSH TO RELEASE
FUEL
PUSH ON PULL OFF

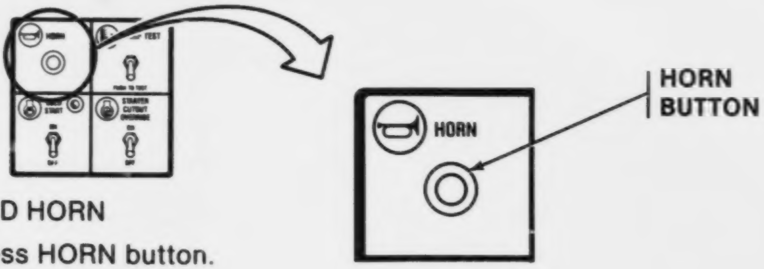
NOTE

If temperature is + 40° (+ 4°C) or more, do steps 16 thru 19. If temperature is + 40° (+ 4°C) or less, do steps 20 thru 29.

START ENGINE ABOVE + 40°F (+4°C)

NOTE

If tactical situation permits, horn should be sounded to warn soldiers that engine is about to be started.


HORN
LAMP TEST
PUSH TO TEST
COLD START
STARTER CUTOUT OVERRIDE
ON
OFF
HORN
HORN BUTTON

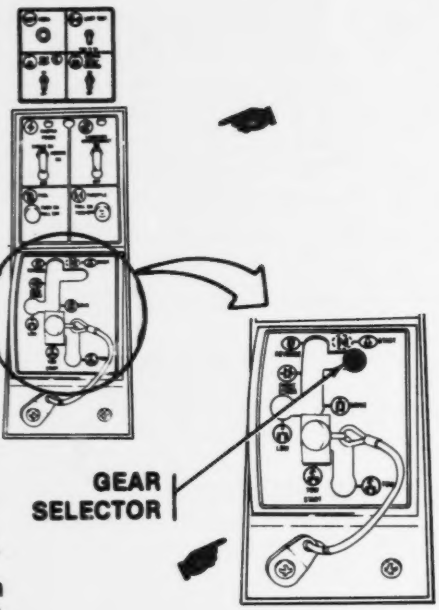
16. SOUND HORN
    a. Press HORN button.

CAUTION

Removal of TOW START lockout during normal carrier operation can cause transmission damage. Do not remove lockout except when TOW START or TOW position is required.

Holding gear selector in START for more than 30 seconds can damage starter. Do not hold gear selector in START for more than 30 seconds at a time. If engine does not start on first try, wait 1 minute and try again.

17. MOVE GEAR SELECTOR TO START AND HOLD UNTIL ENGINE STARTS, BUT NO LONGER THAN 30 SECONDS.
    a. If engine does not start on first try, wait 1 minute and try again.
    b. If engine does not start after three tries, notify unit maintenance.


GEAR SELECTOR

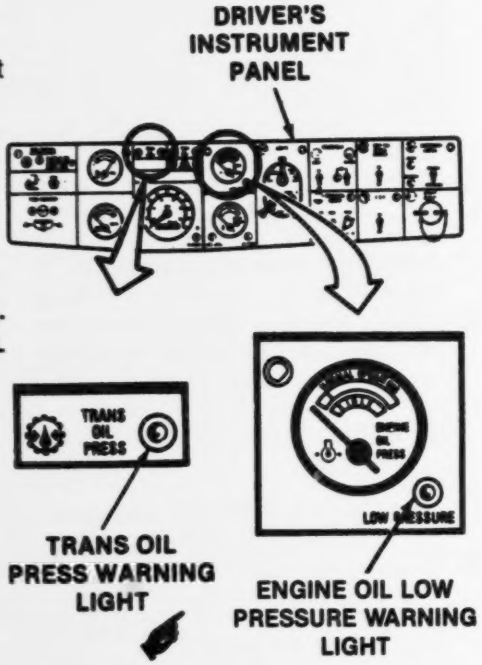
CAUTION

Power unit can get damaged. Stop engine if warning lights do not go off in 30 seconds.

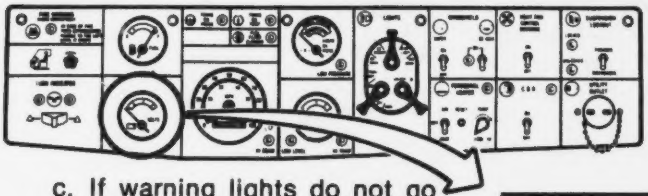
NOTE

Engine speed may have to be increased above idle for TRANS OIL PRESS warning light to go off.

18. CHECK DRIVER'S INSTRUMENT PANEL.
    a. Check that TRANS OIL PRESS warning light goes off.
    b. Check that ENGINE OIL LOW PRESSURE warning light goes off.

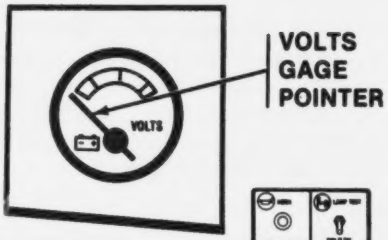

DRIVER'S INSTRUMENT PANEL
TRANS OIL PRESS
ENGINE OIL PRESS
LOW PRESSURE
TRANS OIL PRESS WARNING LIGHT
ENGINE OIL LOW PRESSURE WARNING LIGHT

GO TO NEXT PAGE

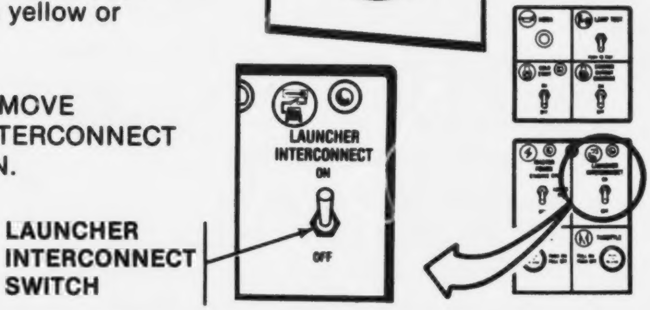


c. If warning lights do not go off within 30 seconds after engine is running, stop engine. Notify unit maintenance.

d. Check that VOLTS gage pointer is in yellow or green zone.


VOLTS
VOLTS GAGE POINTER

19. IF REQUIRED: MOVE LAUNCHER INTERCONNECT SWITCH TO ON.


LAUNCHER INTERCONNECT
ON
OFF
LAUNCHER INTERCONNECT SWITCH

START ENGINE BELOW +40°F (+4°C)

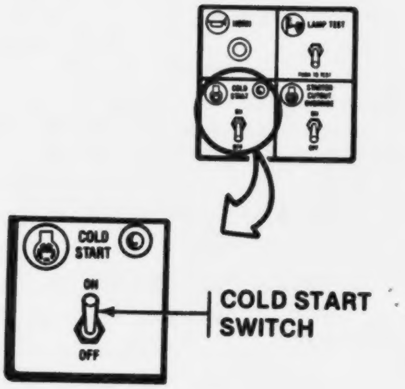
CAUTION

Cold start pumps or glow plugs will get damaged when you leave cold start switch on for more than 2 minutes after starting engine. If engine is not running smoothly after 2 minutes, release cold start switch, wait 2 minutes and then move switch back to on.

20. MOVE COLD START SWITCH TO ON.

a. If COLD START indicator light does not come on, notify unit maintenance.

b. Wait 1 minute for glow plug to heat.


COLD START
ON
OFF
COLD START SWITCH

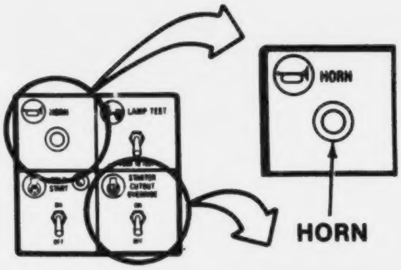
NOTE

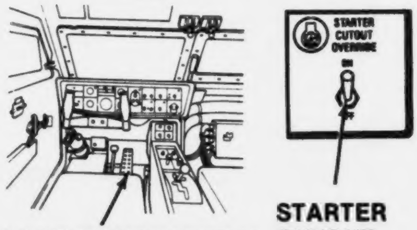
If tactical situation permits, horn should be sounded to warn soldiers that engine is about to be started.

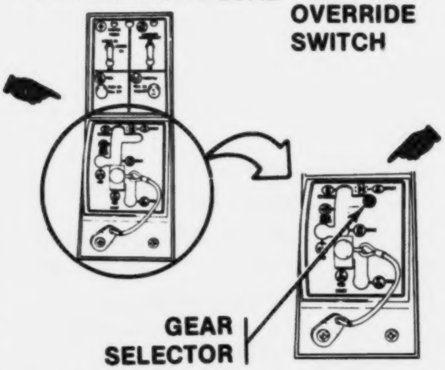
21. SOUND HORN.
    a. Press HORN button.

22. MOVE STARTER CUTOUT OVERRIDE SWITCH TO ON.

23. PRESS DOWN ACCELERATOR PEDAL ABOUT 1/4 INCH.


HORN
LAMP TEST
COLD START
STARTER CUTOUT OVERRIDE
ON
OFF
HORN
HORN

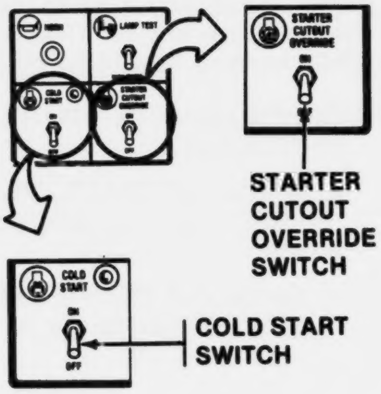

STARTER CUTOUT OVERRIDE
ON
ACCELERATOR PEDAL
STARTER CUTOUT OVERRIDE SWITCH


GEAR SELECTOR

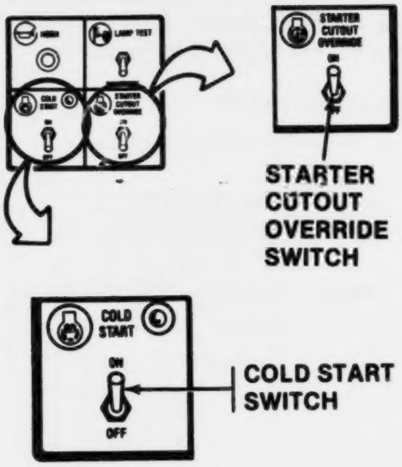
CAUTION

Holding gear selector in START for more than 30 seconds can damage starter. Do not hold gear selector in START for more than 30 seconds at a time. If engine does not start on first try, wait 1 minute and try again.

24. MOVE GEAR SELECTOR TO START AND HOLD UNTIL ENGINE STARTS, BUT NO LONGER THAN 30 SECONDS.
    a. If engine fails to start, release COLD START switch. Wait 1 minute, and repeat steps 20 thru 24.
    b. If engine fails to start after three tries, notify unit maintenance.


HORN
LAMP TEST
COLD START
STARTER CUTOUT OVERRIDE
ON
OFF
STARTER CUTOUT OVERRIDE
ON
STARTER CUTOUT OVERRIDE SWITCH
COLD START
ON
OFF
COLD START SWITCH

GO TO NEXT PAGE


LAMP TEST
COLD START
STARTER CUTOUT OVERRIDE
ON
STARTER CUTOUT OVERRIDE SWITCH
COLD START
ON
OFF
COLD START SWITCH

25. MOVE STARTER CUTOUT OVERRIDE SWITCH TO OFF.

26. RELEASE COLD START SWITCH.

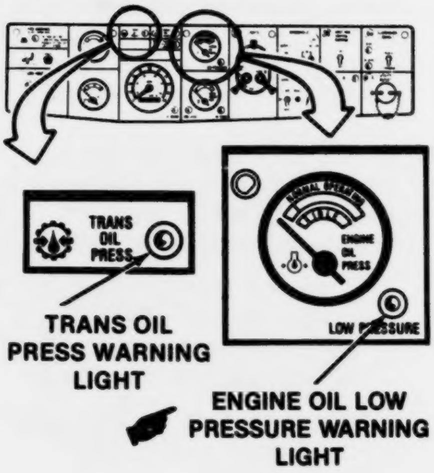
CAUTION

Power unit can get damaged. Stop engine if warning lights do not go off in 30 seconds.

NOTE

Engine speed may have to be increased above idle for TRANS OIL PRESS warning light to go off.

27. CHECK DRIVER'S INSTRUMENT PANEL.
    a. Check that TRANS OIL PRESS warning light goes off.
    b. Check that ENGINE OIL LOW PRESSURE warning light goes off.

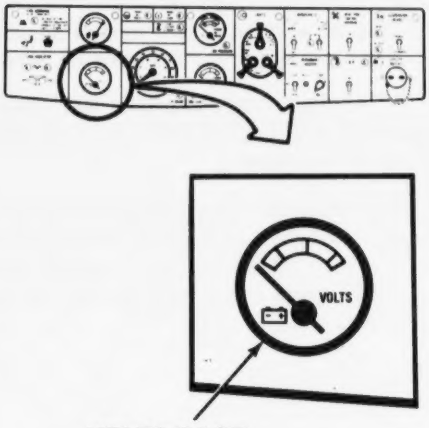

TRANS OIL PRESS
NORMAL OPERATING
ENGINE OIL PRESS
LOW PRESSURE
TRANS OIL PRESS WARNING LIGHT
ENGINE OIL LOW PRESSURE WARNING LIGHT

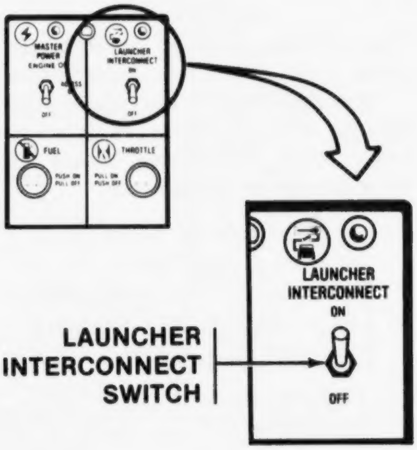
c. If warning lights do not go off within 30 seconds after engine is running, stop engine. Notify organizational maintenance.

d. Check that VOLTS gage pointer is in yellow or green zone.

28. IF REQUIRED: MOVE LAUNCHER INTERCONNECT SWITCH TO ON.

29. ENGINE WARM-UP. ALLOW ENGINE TO LO IDLE FOR ABOUT 1 MINUTE.


VOLTS
VOLTS GAGE


MASTER POWER
ENGINE OFF
OFF
LAUNCHER INTERCONNECT
ON
OFF
FUEL
PUSH ON PULL OFF
THROTTLE
PULL ON PUSH OFF
LAUNCHER INTERCONNECT
ON
OFF
LAUNCHER INTERCONNECT SWITCH

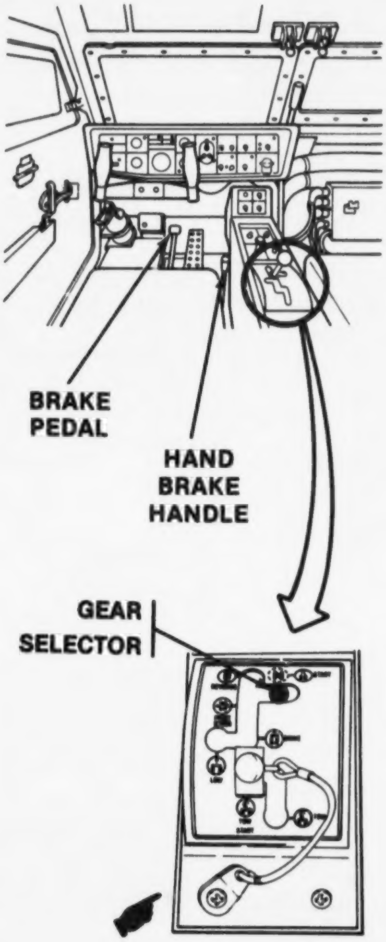
GO TO NEXT PAGE

NOTE

Step 30 applies only if carrier has not been operated for 8 hours or more.

If ambient temperature has been above 5°F (-35°F if OEA oil in use), go to substep b.

If carrier has been shutdown within last 16 hours at coolant temperature 3/4 into green zone of gage, and intake grille has been covered, go to substep b.



30. WARM UP TRANSMISSION.

CAUTION

Transmission damage could occur when gear selector is moved from N (neutral) before completing 35 minute idle. Do not move gear selector from N (neutral) before 35 minute idle is completed.

a. Idle engine at least 35 minutes. See task: WARM-UP PROCEDURES FOR EXTENDED ENGINE IDLING, page 2-250.

b. Step on brake pedal and hold.

c. Release hand brake. Push hand brake handle all the way down.

d. Maintain foot pressure on brake pedal.

NOTE

Engaging a cold transmission in PIVOT STEER may stall the engine. Press accelerator only as needed to prevent stalling the engine.

WARNING

When shifting gear selector into PIVOT STEER, carrier can move if steering yoke is moved from center. Soldiers can be killed or injured. Hold brake pedal on; clear all soldiers away from carrier when shift into PIVOT STEER. Do not move from centered position.

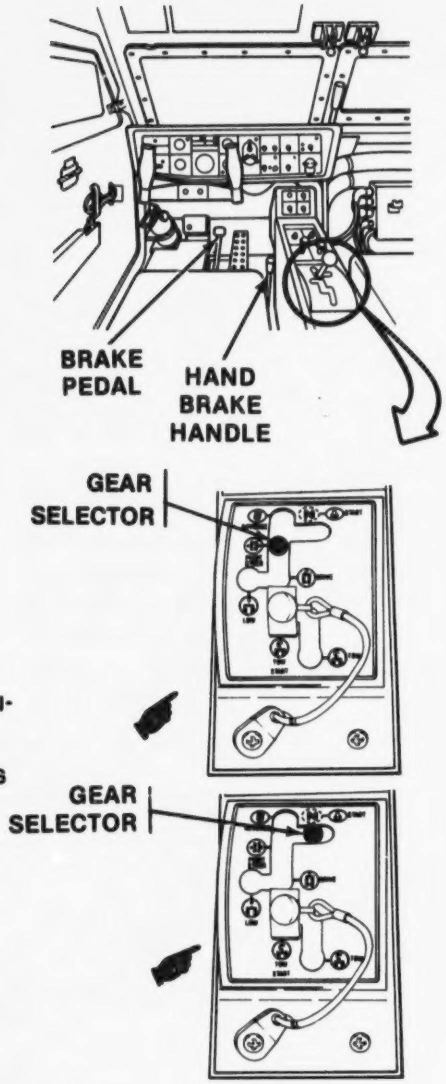
e. Shift selector into PIVOT STEER.

f. Idle engine for about 2-5 minutes.

g. Move gear selector to N (neutral).

h. Pull hand brake handle up as far as it will go.

i. Release foot pressure from brake pedal.



END OF TASK

START ENGINE USING OUTSIDE POWER SOURCE

DESCRIPTION

This task covers: Start Engine Using an Operational Carrier (page 2-137). Start Engine Using An Operational Vehicle (page 2-145). Start Engine Using An Auxiliary Power Unit (APU) as an Outside Power Source (page 2-151).

INITIAL SETUP

Tools:

Slave cable — 2590-00-148-7961
24 volt power source (carrier or vehicle) or 24 volt auxiliary power unit (APU)

Personnel Required:

Driver
Gunner

References:

TM 11-5820-401-10-2

Equipment Conditions:

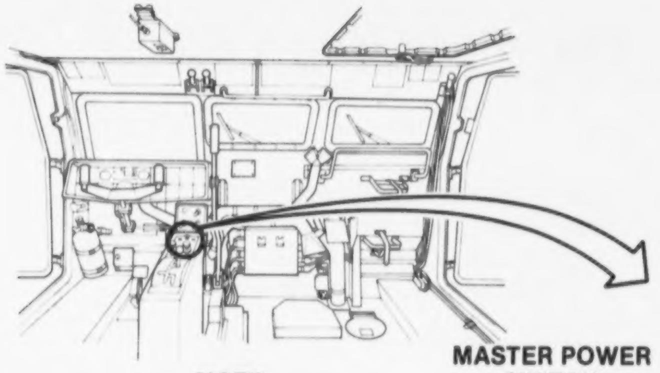
Carrier unable to start under own power
Operational carrier engine stopped, or operational vehicle engine stopped, or APU shut down

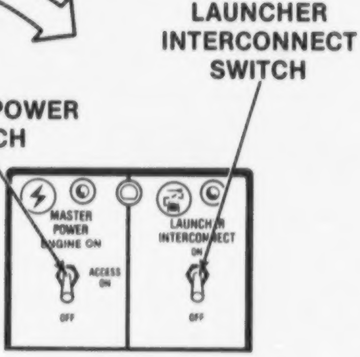
START ENGINE USING AN OPERATIONAL CARRIER

CAUTION

Battery or electrical damage can occur if electrical switches are left on when carrier is started with outside power source. Turn off all electrical switches in both carriers before you start carrier with outside power source.

GO TO NEXT PAGE



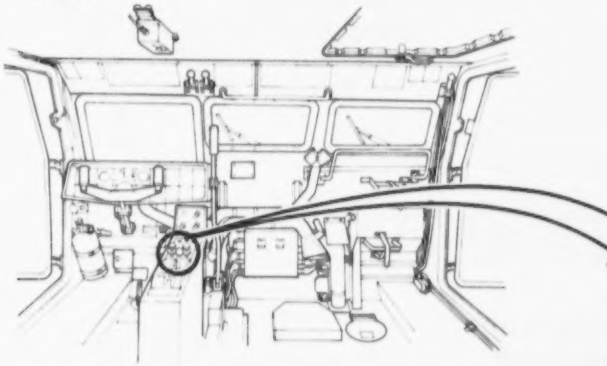

LAUNCHER INTERCONNECT SWITCH
MASTER POWER SWITCH
MASTER POWER ENGINE ON
ACCESS ON
OFF
LAUNCHER INTERCONNECT ON
OFF

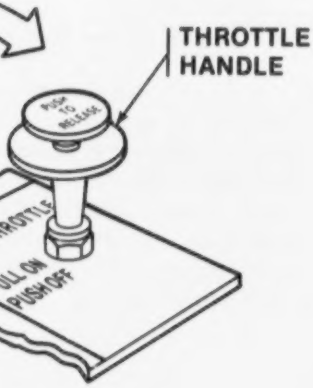
NOTE

Steps 1 thru 8 should be done in both operational and disabled carriers.

1. CHECK THAT MASTER POWER SWITCH IS OFF.

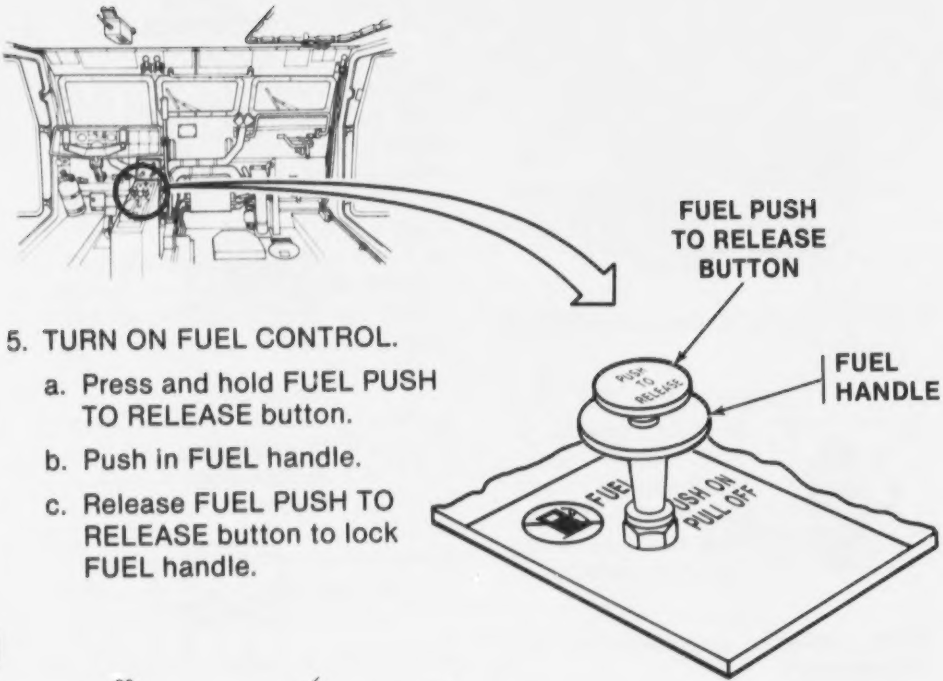
2. CHECK THAT LAUNCHER INTERCONNECT SWITCH IS OFF.



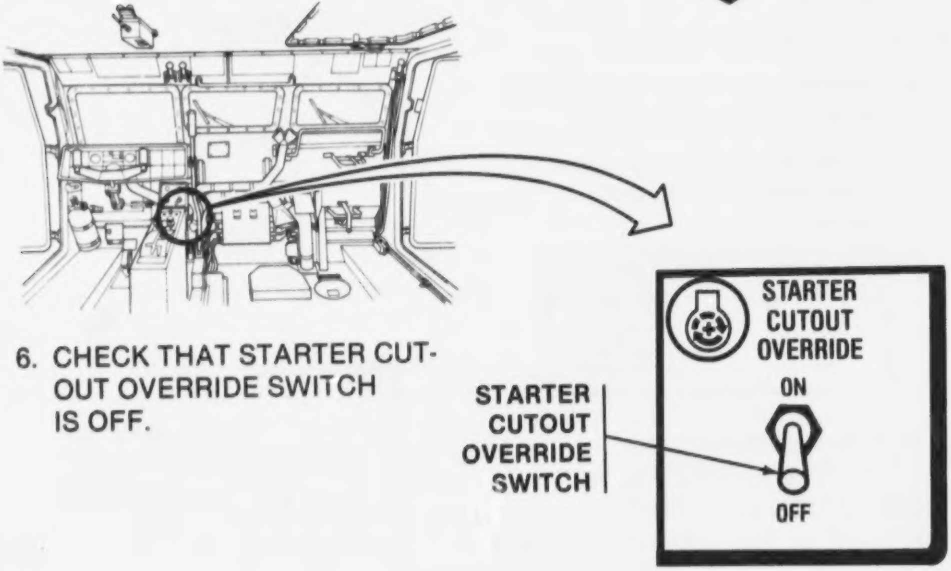

THROTTLE HANDLE
PUSH TO RELEASE
THROTTLE
PULL ON
PUSH OFF

3. CHECK THAT THROTTLE HANDLE IS OFF.

4. CHECK THAT ALL RADIO EQUIPMENT IS OFF. See TM 1-5820-401-10-2.

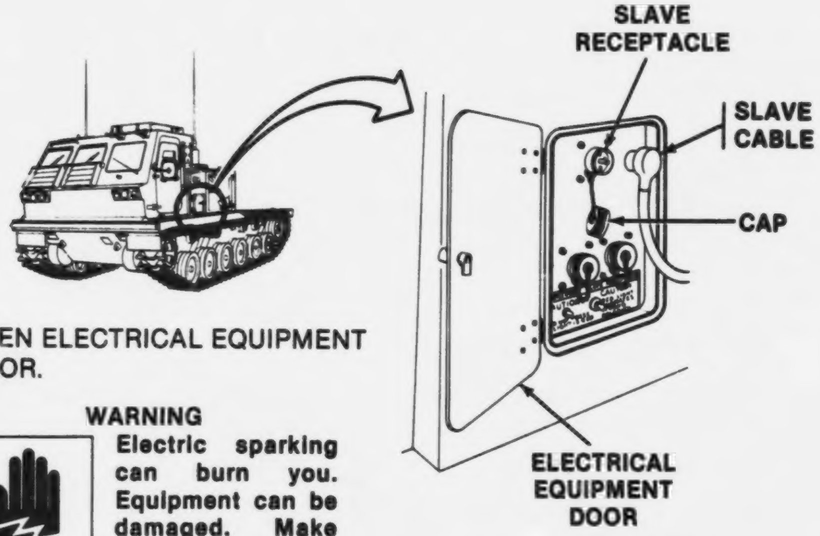

FUEL PUSH TO RELEASE BUTTON
FUEL HANDLE
PUSH TO RELEASE
FUEL
PUSH ON PULL OFF

5. TURN ON FUEL CONTROL.
   a. Press and hold FUEL PUSH TO RELEASE button.
   b. Push in FUEL handle.
   c. Release FUEL PUSH TO RELEASE button to lock FUEL handle.


STARTER CUTOUT OVERRIDE
ON
OFF
STARTER CUTOUT OVERRIDE SWITCH

6. CHECK THAT STARTER CUTOUT OVERRIDE SWITCH IS OFF.

GO TO NEXT PAGE


SLAVE RECEPTACLE
SLAVE CABLE
CAP
ELECTRICAL EQUIPMENT DOOR

7. OPEN ELECTRICAL EQUIPMENT DOOR.

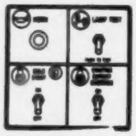
WARNING

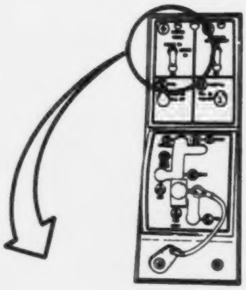
Electric sparking can burn you. Equipment can be damaged. Make sure slave cable is installed properly.

NOTE

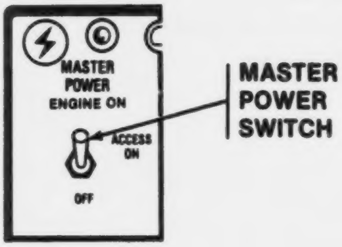
Slave cable is obtained from unit maintenance.

8. INSTALL SLAVE CABLE.
   - a. Remove cap from slave receptacle on disabled carrier.
   - b. Plug slave cable into slave receptacle on disabled carrier.
   - c. Repeat substeps a and b above in operational carrier.





9. MOVE MASTER POWER SWITCH TO ENGINE ON IN OPERATIONAL CARRIER.


MASTER POWER ENGINE ON
ACCESS ON
OFF
MASTER POWER SWITCH

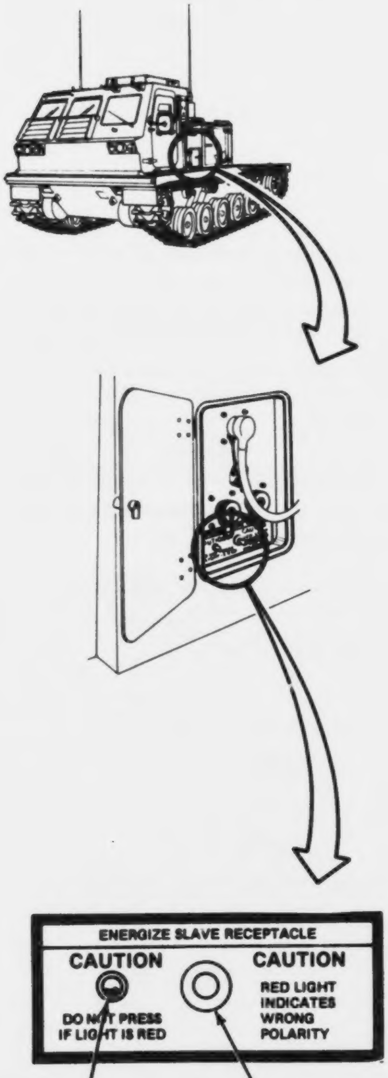
WARNING

Batteries can explode if you start engine with outside power source when ENERGIZE SLAVE RECEPTACLE CAUTION light is red. Soldiers could be killed or injured. If ENERGIZE SLAVE RECEPTACLE CAUTION light is red, stop task immediately.

CAUTION

Battery and/or electrical system can be damaged if ENERGIZE SLAVE RECEPTACLE CAUTION light is red. ENERGIZE SLAVE RECEPTACLE CAUTION light on disabled carrier must be green before you try to start disabled carrier with operational carrier.

10. ENERGIZE SLAVE RECEPTACLE ON OPERATIONAL CARRIER AND DISABLED CARRIER.
    a. Press ENERGIZE SLAVE RECEPTACLE button on operational carrier.
    b. If ENERGIZE SLAVE RECEPTACLE CAUTION light on disabled carrier is green, go to step 11.
    c. If ENERGIZE SLAVE RECEPTACLE CAUTION light on disabled carrier is red, immediately go to step 15 and stop task. Do not attempt to start carrier. Notify unit maintenance.


ENERGIZE SLAVE RECEPTACLE
CAUTION
DO NOT PRESS IF LIGHT IS RED
CAUTION
RED LIGHT INDICATES WRONG POLARITY

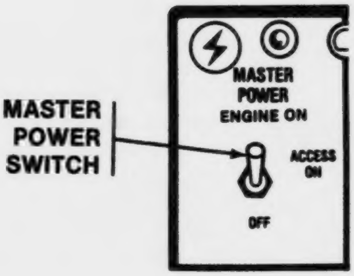
ENERGIZE SLAVE RECEPTACLE BUTTON

ENERGIZE SLAVE RECEPTACLE CAUTION LIGHT

GO TO NEXT PAGE

11. START ENGINE OF OPERATIONAL CARRIER. See page 2-123.

12. MOVE MASTER POWER SWITCH TO ENGINE ON IN DISABLED CARRIER.



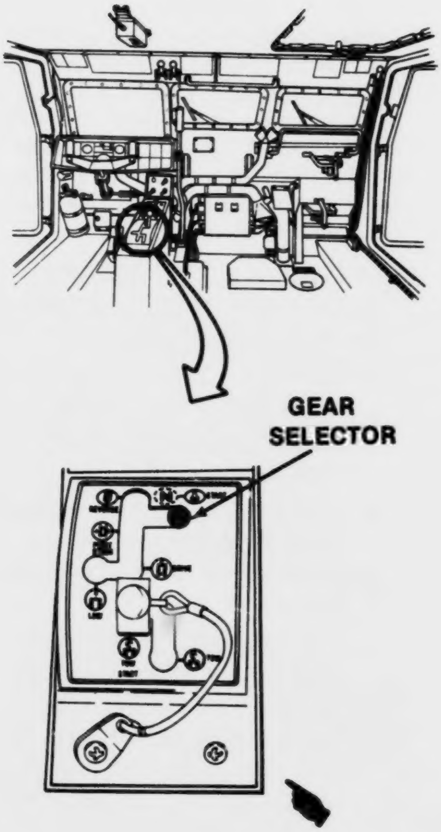
CAUTION

Holding gear selector in START for more than 30 seconds can damage starter. Do not hold gear selector in START for more than 30 seconds at a time. If engine does not start on first try, wait 1 minute and try again.

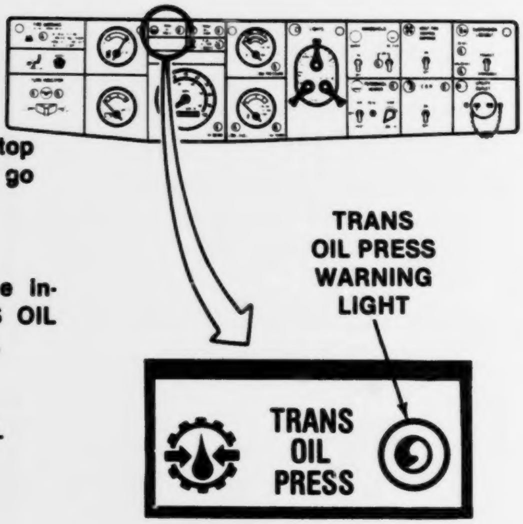
NOTE

At temperatures of +40°F to -25°F, do step 12.1. If temperature is not in that range, do step 13.

12.1 START ENGINE BELOW +40°F (+4°C). See page 2-130.



13. MOVE GEAR SELECTOR TO START ON DISABLED CARRIER AND HOLD UNTIL ENGINE STARTS, BUT NOT FOR MORE THAN 30 SECONDS.
    a. If carrier does not start, wait 1 minute and try again.
    b. If engine does not start after three tries, notify unit maintenance.


TRANS
OIL PRESS
WARNING
LIGHT
TRANS
OIL
PRESS

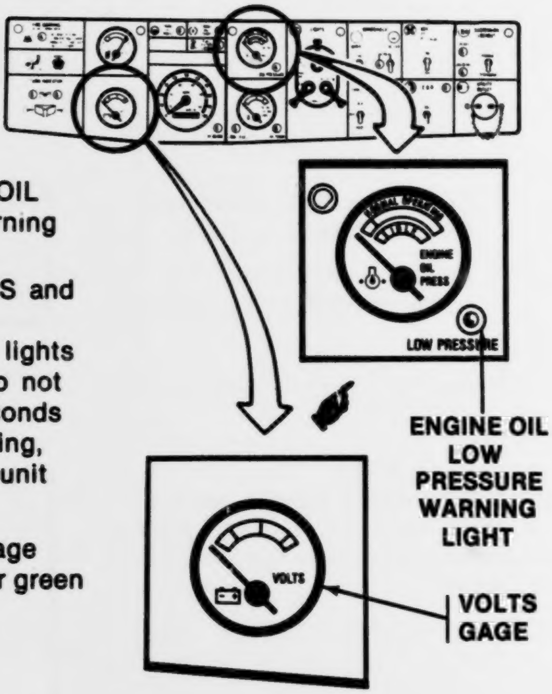
CAUTION

Power unit can get damaged. Stop engine if warning lights do not go off in 30 seconds.

NOTE

Engine speed may have to be increased above idle for TRANS OIL PRESS warning light to go off.

14. WHEN ENGINE STARTS, CHECK DRIVER'S INSTRUMENT PANEL.
    a. Check that TRANS OIL PRESS warning light goes off.


ENGINE
OIL
PRESS
LOW PRESSURE
ENGINE OIL
LOW
PRESSURE
WARNING
LIGHT
VOLTS
VOLTS
GAGE

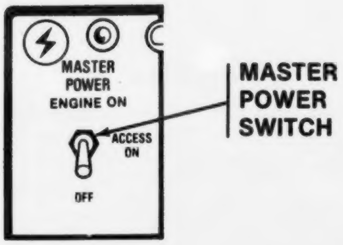
    b. Check that ENGINE OIL LOW PRESSURE warning light goes off.
    c. If TRANS OIL PRESS and ENGINE OIL LOW PRESSURE warning lights and warning tone do not go off within 30 seconds after engine is running, stop engine. Notify unit maintenance.
    d. Check that VOLTS gage pointer is in yellow or green zone.

GO TO NEXT PAGE

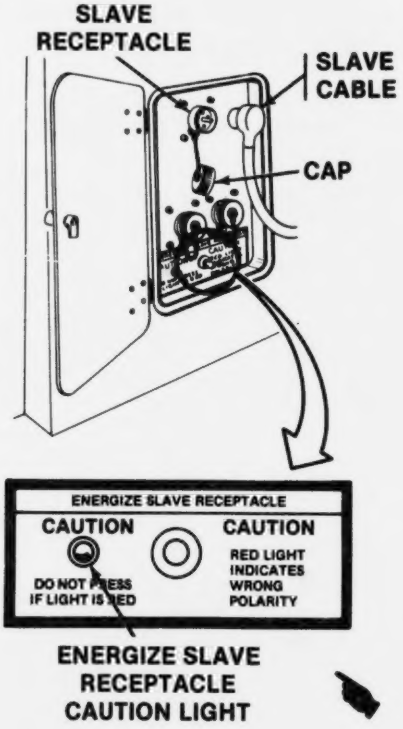
CAUTION

If SLAVE RECEPTACLE is not deenergized before slave cable is removed, slave cable and SLAVE RECEPTACLE could be damaged.

15. DEENERGIZE SLAVE RECEPTACLE IN OPERATIONAL CARRIER AND DISABLED CARRIER.
    a. Move MASTER POWER switch to OFF in both carriers.
    b. Check that ENERGIZE SLAVE RECEPTACLE CAUTION light is off. If caution light is not off, repeat substeps a and b above. If this fails, notify unit maintenance.


MASTER
POWER
ENGINE ON
ACCESS ON
OFF
MASTER POWER SWITCH

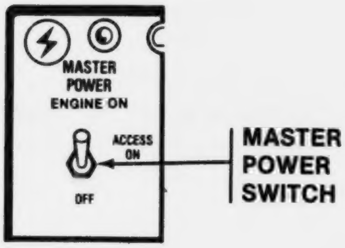
16. REMOVE SLAVE CABLE.
    a. Unplug slave cable from slave receptacle on disabled carrier.
    b. Install cap on slave receptacle on disabled carrier.
    c. Repeat substeps a and b above in operational carrier.


SLAVE RECEPTACLE
SLAVE CABLE
CAP
ENERGIZE SLAVE RECEPTACLE
CAUTION
DO NOT PRESS IF LIGHT IS RED
CAUTION
RED LIGHT INDICATES WRONG POLARITY
ENERGIZE SLAVE RECEPTACLE CAUTION LIGHT

NOTE

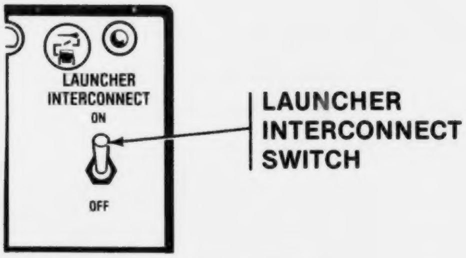
If MASTER POWER switch is left OFF for more than 10 minutes while engine is running, the engine may run out of fuel.

17. MOVE MASTER POWER SWITCH TO ENGINE ON IN DISABLED CARRIER.


MASTER
POWER
ENGINE ON
ACCESS ON
OFF
MASTER POWER SWITCH

18. MOVE LAUNCHER INTERCONNECT SWITCH TO ON IN DISABLED CARRIER.

19. STOP ENGINE IN OPERATIONAL CARRIER. See page 2-167.


LAUNCHER
INTERCONNECT
ON
OFF
LAUNCHER INTERCONNECT SWITCH

START ENGINE USING AN OPERATIONAL VEHICLE

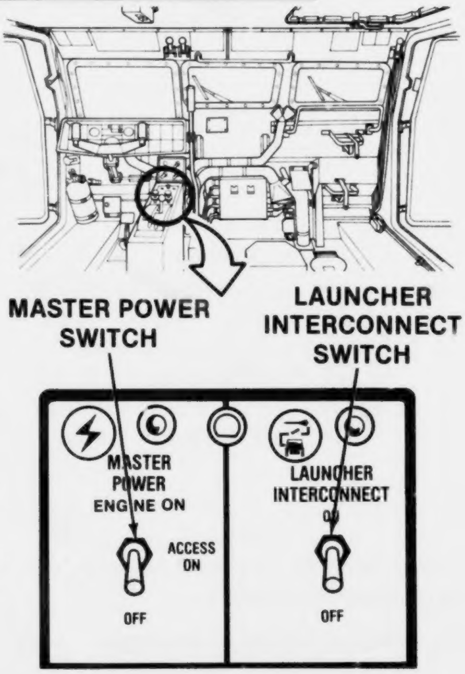
CAUTION

Battery or electrical damage can occur if electrical switches are left on when carrier is started with outside power source. Turn off all electrical switches in both operational vehicle and disabled carrier before you start disabled carrier with outside power source.

NOTE

If a vehicle other than a carrier is used as outside power source, refer to proper operator's manual for slave starting procedures.

Steps 20 thru 27 should be done in disabled carrier only.

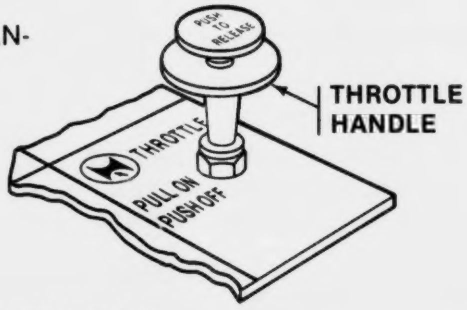

MASTER POWER SWITCH
LAUNCHER INTERCONNECT SWITCH
MASTER
POWER
ENGINE ON
ACCESS ON
OFF
LAUNCHER
INTERCONNECT
ON
OFF

20. CHECK THAT MASTER POWER SWITCH IS OFF.

21. CHECK THAT LAUNCHER INTERCONNECT SWITCH IS OFF.

22. CHECK THAT THROTTLE HANDLE IS OFF.

23. CHECK THAT ALL RADIO EQUIPMENT IS OFF. See TM 11-5820-401-10-2.

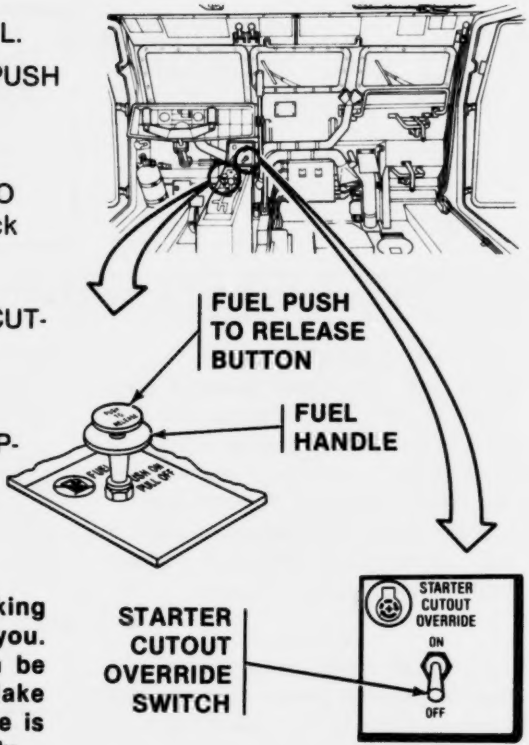

PUSH TO RELEASE
THROTTLE
PULL ON
PUSH OFF
THROTTLE HANDLE

GO TO NEXT PAGE

24. TURN ON FUEL CONTROL.
    a. Press and hold FUEL PUSH TO RELEASE button.
    b. Push in FUEL handle.
    c. Release FUEL PUSH TO RELEASE button to lock FUEL handle.

25. CHECK THAT STARTER CUTOUT OVERRIDE SWITCH IS OFF.

26. OPEN ELECTRICAL EQUIPMENT DOOR.


FUEL PUSH TO RELEASE BUTTON
FUEL HANDLE
STARTER CUTOUT OVERRIDE SWITCH
STARTER CUTOUT OVERRIDE
ON
OFF

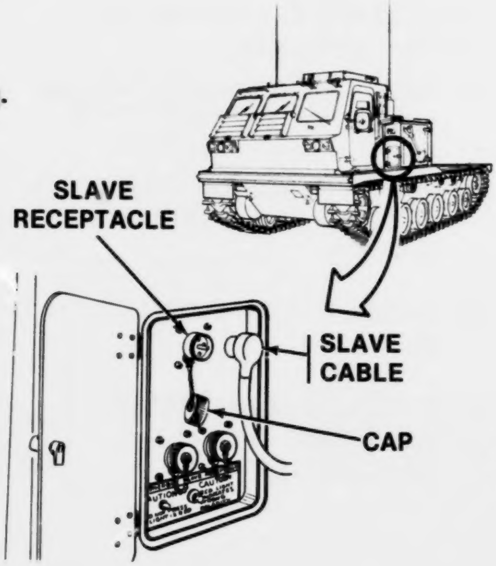
WARNING

Electric sparking can burn you. Equipment can be damaged. Make sure slave cable is installed properly.

NOTE

Slave cable is obtained from organizational maintenance.

27. INSTALL SLAVE CABLE.
    a. Remove cap from slave receptable on disabled carrier.
    b. Plug slave cable into slave receptacle on disabled carrier.
    c. Plug slave cable into slave receptacle on operational carrier.


SLAVE RECEPTACLE
SLAVE CABLE
CAP

28. TURN ON POWER SOURCE IN OPERATIONAL VEHICLE. REFER TO PROPER OPERATOR'S MANUAL.

WARNING

Batteries can explode if you start engine with outside power source when ENERGIZE SLAVE RECEPTACLE CAUTION light is red. Soldiers could be killed or injured. If ENERGIZE SLAVE RECEPTACLE CAUTION light is red, stop task immediately.

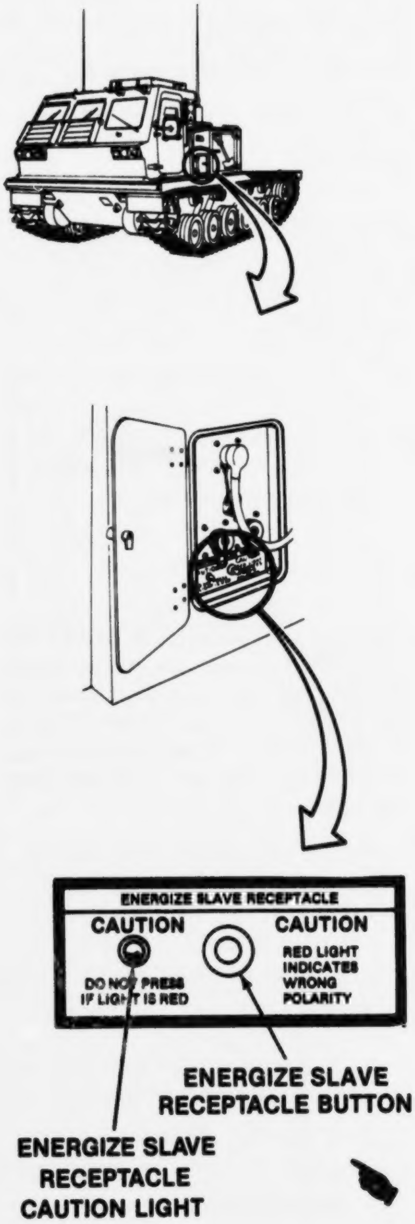
CAUTION

Battery and/or electrical system can be damaged if ENERGIZE SLAVE RECEPTACLE CAUTION light is red. ENERGIZE SLAVE RECEPTACLE CAUTION light must be green before you try to start disabled carrier with operational vehicle.

NOTE

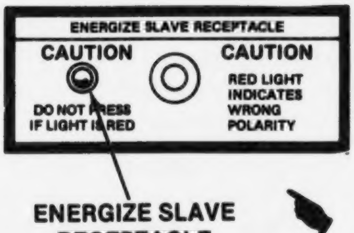
When using another vehicle other than a carrier as outside power source, see proper operator's manual for slave starting procedures.

29. ENERGIZE SLAVE RECEPTACLE IN OPERATIONAL VEHICLE AND DISABLED CARRIER.
    a. Energize slave receptacle in operational vehicle. Refer to proper operator's manual.
    b. If ENERGIZE SLAVE RECEPTACLE CAUTION light on disabled carrier is green, go to step 30.


ENERGIZE SLAVE RECEPTACLE
CAUTION
DO NOT PRESS IF LIGHT IS RED
CAUTION
RED LIGHT INDICATES WRONG POLARITY
ENERGIZE SLAVE RECEPTACLE BUTTON
ENERGIZE SLAVE RECEPTACLE CAUTION LIGHT

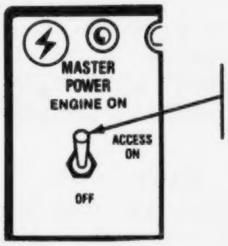
GO TO NEXT PAGE

c. If ENERGIZE SLAVE RECEPTACLE CAUTION light on disabled carrier is red, immediately go to step 34 and stop task. Do not attempt to start carrier. Notify unit maintenance.


ENERGIZE SLAVE RECEPTACLE
CAUTION
CAUTION
DO NOT PRESS IF LIGHT IS RED
RED LIGHT INDICATES WRONG POLARITY

ENERGIZE SLAVE RECEPTACLE CAUTION LIGHT

30. START ENGINE OF OPERATIONAL VEHICLE. REFER TO PROPER OPERATOR'S MANUAL.


MASTER POWER ENGINE ON
ACCESS ON
OFF

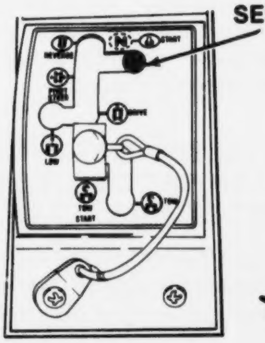
MASTER POWER SWITCH

31. MOVE MASTER POWER SWITCH TO ENGINE ON IN DISABLED CARRIER.

CAUTION

Holding gear selector in START for more than 30 seconds can damage starter. Do not hold gear selector in START for more than 30 seconds at a time. If engine does not start on first try, wait 1 minute and try again.

GEAR SELECTOR


REVERSE
START
DRIVE
LOW
TOW START
TOW

32. MOVE GEAR SELECTOR TO START ON DISABLED CARRIER AND HOLD UNTIL ENGINE STARTS, BUT NOT FOR MORE THAN 30 SECONDS.

   a. If carrier does not start, wait 1 minute and try again.

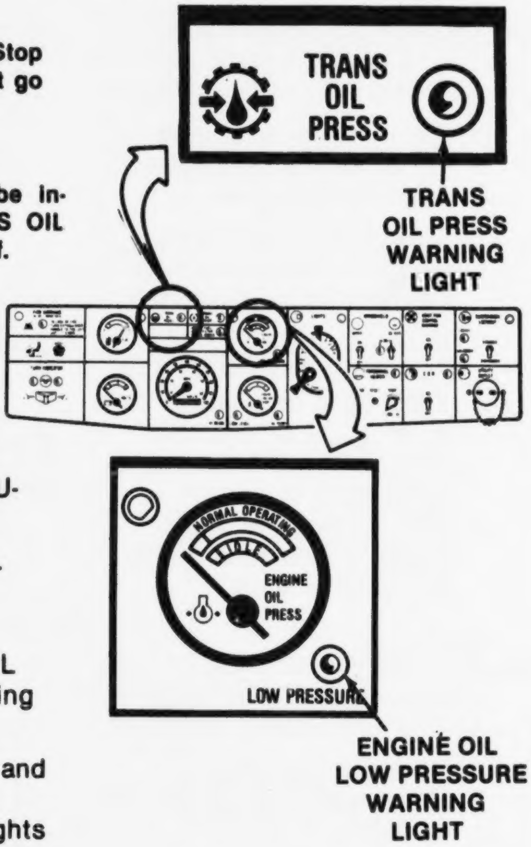
   b. If engine does not start after three tries, notify unit maintenance.

CAUTION

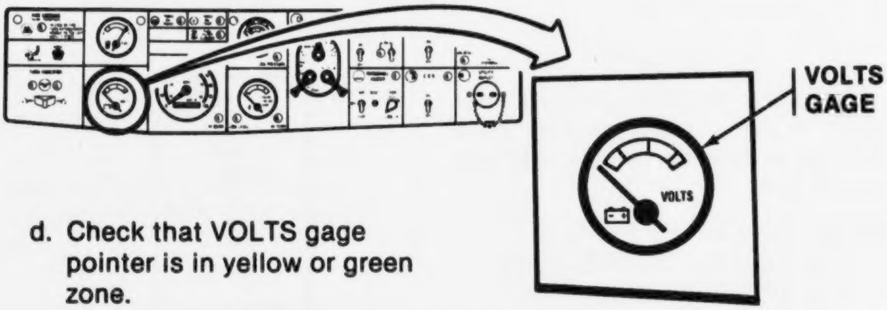
Power unit can get damaged. Stop engine if warning lights do not go off in 30 seconds.

NOTE

Engine speed may have to be increased above idle for TRANS OIL PRESS warning light to go off.


TRANS
OIL
PRESS
TRANS OIL PRESS WARNING LIGHT
NORMAL OPERATING
IDLE
ENGINE OIL PRESS
LOW PRESSURE
ENGINE OIL LOW PRESSURE WARNING LIGHT

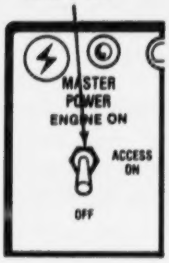
33. WHEN ENGINE STARTS, CHECK DRIVER'S INSTRUMENT PANEL.
    a. Check that TRANS OIL PRESS warning light goes off.
    b. Check that ENGINE OIL LOW PRESSURE warning light goes off.
    c. If TRANS OIL PRESS and ENGINE OIL LOW PRESSURE warning lights and warning tone do not go off within 30 seconds after engine is running, stop engine. Notify unit maintenance.

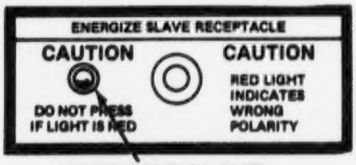

VOLTS GAGE
VOLTS

    d. Check that VOLTS gage pointer is in yellow or green zone.

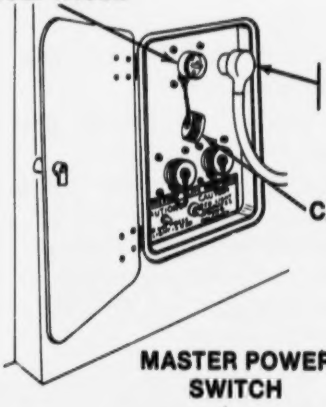
GO TO NEXT PAGE

34. DEENERGIZE SLAVE RECEPTACLE IN OPERATIONAL VEHICLE AND DISABLED CARRIER.
    a. Turn off power in operational vehicle. See proper operator's manual.
    b. Move MASTER POWER switch to OFF in disabled carrier.
    c. Check that ENERGIZE SLAVE RECEPTACLE CAUTION light in disabled carrier is off. If ENERGIZE SLAVE RECEPTACLE CAUTION light is not off, repeat substeps a and b above. If this fails, notify unit maintenance.


MASTER POWER SWITCH
MASTER POWER
ENGINE ON
ACCESS ON
OFF

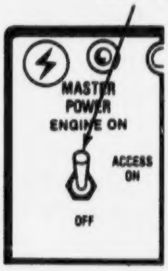

ENERGIZE SLAVE RECEPTACLE
CAUTION
CAUTION
DO NOT PRESS IF LIGHT IS RED
RED LIGHT INDICATES WRONG POLARITY
ENERGIZE SLAVE RECEPTACLE CAUTION LIGHT

35. REMOVE SLAVE CABLE FROM BOTH DISABLED CARRIER AND OPERATIONAL VEHICLE.
    a. Unplug slave cable from slave receptacle on disabled carrier.
    b. Install cap on slave receptacle on disabled carrier.
    c. Unplug slave cable from slave receptacle of operational vehicle.


SLAVE RECEPTACLE
SLAVE CABLE
CAP

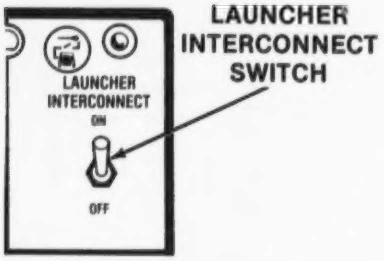
NOTE
If MASTER POWER switch is left OFF for more than 10 minutes while engine is running, engine may run out of fuel.

36. MOVE MASTER POWER SWITCH TO ENGINE ON IN DISABLED CARRIER.


MASTER POWER SWITCH
MASTER POWER
ENGINE ON
ACCESS ON
OFF

37. MOVE LAUNCHER INTERCONNECT SWITCH TO ON IN DISABLED CARRIER.

38. SHUT DOWN OPERATIONAL VEHICLE. REFER TO PROPER OPERATOR'S MANUAL.


LAUNCHER INTERCONNECT SWITCH
LAUNCHER INTERCONNECT
ON
OFF

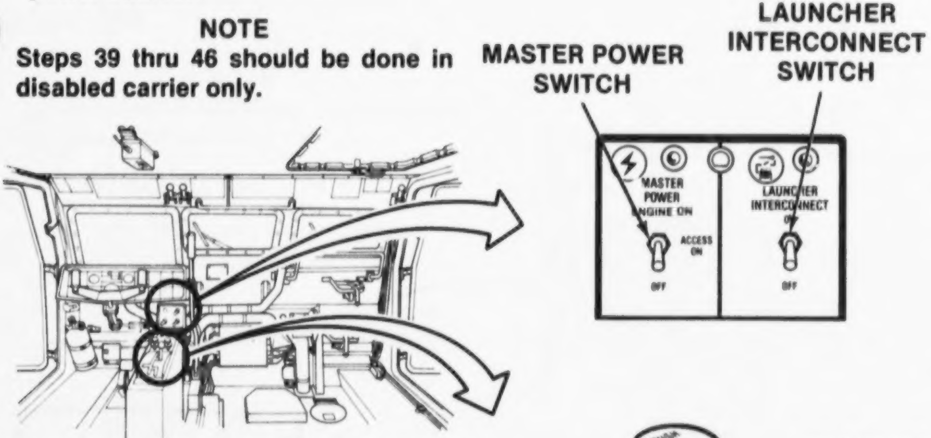
START ENGINE USING AN AUXILIARY POWER UNIT (APU) AS AN OUTSIDE POWER SOURCE

CAUTION

Battery or electrical damage can occur if electrical switches are left on when carrier is started with outside power source. Turn off all electrical switches in both disabled carrier and APU before you start disabled carrier with outside power source.

NOTE

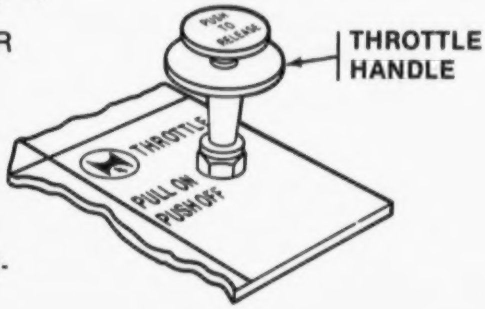
Steps 39 thru 46 should be done in disabled carrier only.


MASTER POWER SWITCH
LAUNCHER INTERCONNECT SWITCH
MASTER POWER ENGINE ON
ACCESS ON
OFF
LAUNCHER INTERCONNECT ON
OFF

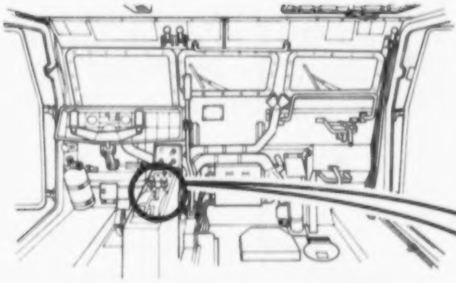
39. CHECK THAT MASTER POWER SWITCH IS OFF.

40. CHECK THAT LAUNCHER INTERCONNECT SWITCH IS OFF.

41. CHECK THAT THROTTLE HANDLE IS OFF.

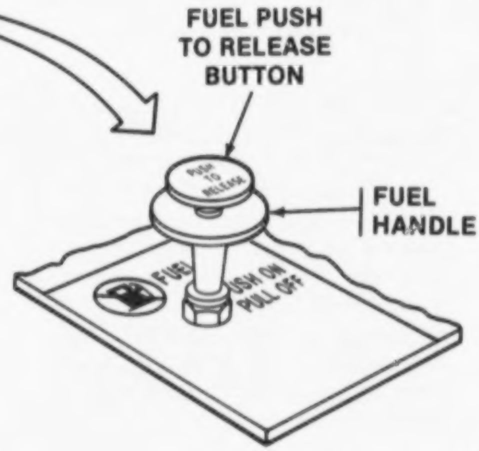

THROTTLE HANDLE
PUSH TO RELEASE
THROTTLE
PULL ON
PUSH OFF

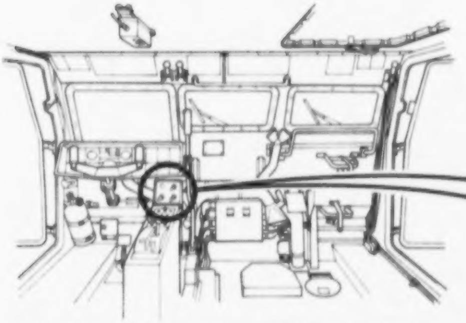
GO TO NEXT PAGE



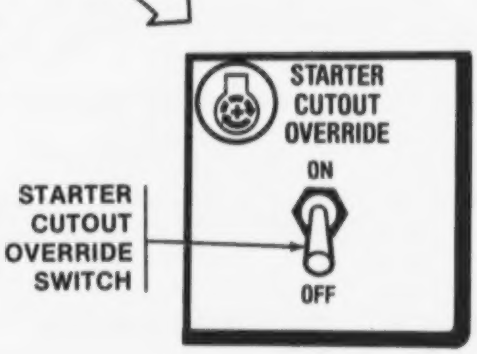
42. CHECK THAT ALL RADIO EQUIPMENT IS OFF. See TM 11-5820-401-10-2.

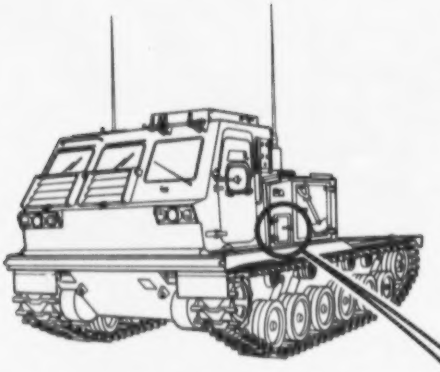
43. TURN ON FUEL CONTROL.
    a. Press and hold FUEL PUSH TO RELEASE button.
    b. Push in FUEL handle.
    c. Release FUEL PUSH TO RELEASE button to lock FUEL handle.


FUEL PUSH TO RELEASE BUTTON
FUEL HANDLE
PUSH TO RELEASE
FUEL
PUSH ON PULL OFF



44. CHECK THAT STARTER CUTOUT OVERRIDE SWITCH IS OFF.


STARTER CUTOUT OVERRIDE
ON
OFF
STARTER CUTOUT OVERRIDE SWITCH



45. OPEN ELECTRICAL EQUIPMENT DOOR.

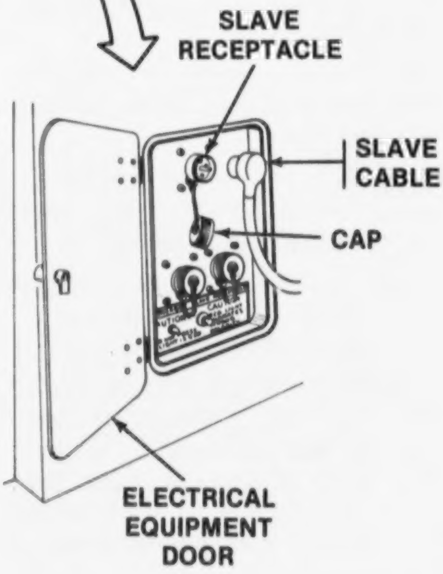
WARNING

Electric sparking can burn you. Equipment can be damaged. Make sure slave cable is installed properly.

NOTE

Slave cable is obtained from organizational maintenance.

46. INSTALL SLAVE CABLE.
    - a. Remove cap from slave receptacle on disabled carrier.
    - b. Plug slave cable into slave receptacle on disabled carrier.
    - c. Plug slave cable into slave receptacle on APU.


SLAVE RECEPTACLE
SLAVE CABLE
CAP
ELECTRICAL EQUIPMENT DOOR

47. TURN ON APU.

GO TO NEXT PAGE

WARNING

Batteries can explode if you start engine with outside power source when ENERGIZE SLAVE RECEPTACLE CAUTION light is red. Soldiers could be killed or injured. If ENERGIZE SLAVE RECEPTACLE CAUTION light is red, stop task immediately.

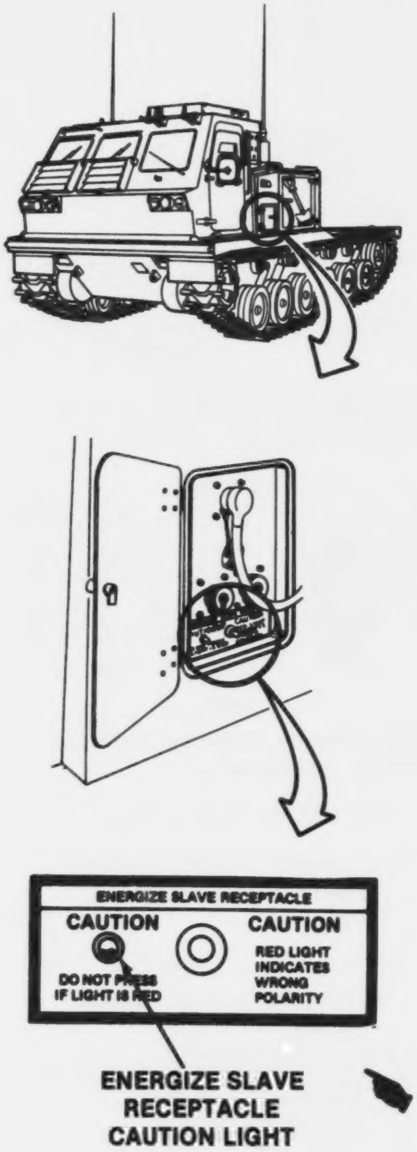
CAUTION

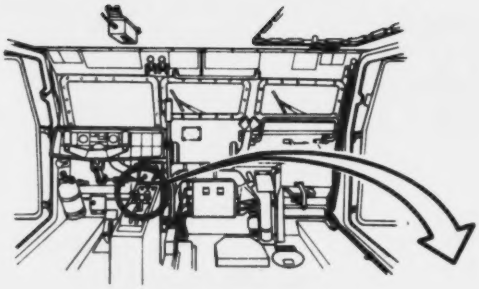
Battery and/or electrical system can be damaged if ENERGIZE SLAVE RECEPTACLE CAUTION light is red. ENERGIZE SLAVE RECEPTACLE CAUTION light must be green in disabled carrier before starting disabled carrier with APU.

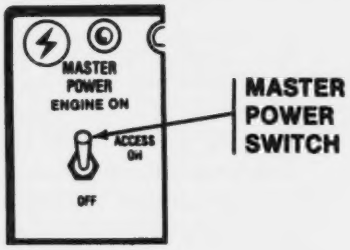
NOTE

Step 48 is to be done on disabled carrier only.

48. CHECK ENERGIZE SLAVE RECEPTACLE CAUTION LIGHT IN DISABLED CARRIER.
    a. If ENERGIZE SLAVE RECEPTACLE CAUTION light is green, go to step 49.
    b. If ENERGIZE SLAVE RECEPTACLE CAUTION light is red, immediately go to step 52 and stop task. Do not attempt to start carrier. Notify unit maintenance.


ENERGIZE SLAVE RECEPTACLE
CAUTION
DO NOT PRESS IF LIGHT IS RED
CAUTION
RED LIGHT INDICATES WRONG POLARITY
ENERGIZE SLAVE RECEPTACLE CAUTION LIGHT



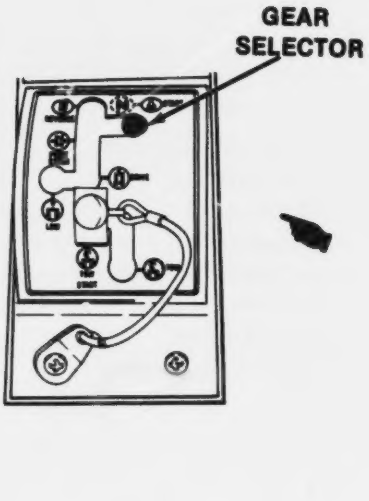

MASTER
POWER
ENGINE ON
ACCESS
ON
OFF
MASTER POWER SWITCH

49. MOVE MASTER POWER SWITCH TO ENGINE ON IN DISABLED CARRIER.

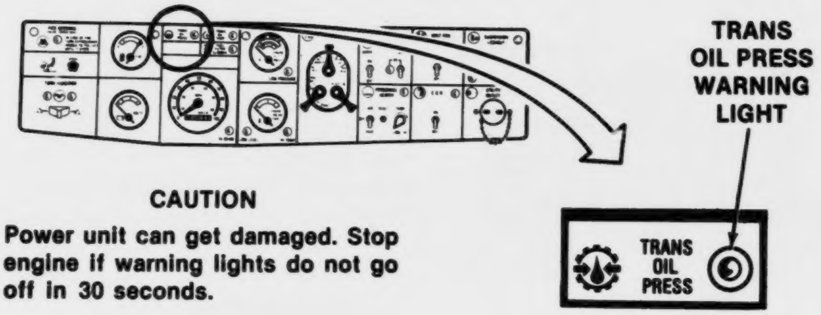
CAUTION

Holding gear selector in START for more than 30 seconds can damage starter. Do not hold gear selector in START for more than 30 seconds at a time. If engine does not start on first try, wait 1 minute and try again.

50. MOVE GEAR SELECTOR TO START ON DISABLED CARRIER AND HOLD UNTIL ENGINE STARTS, BUT NOT FOR MORE THAN 30 SECONDS.
    a. If carrier does not start, wait 1 minute and try again.
    b. If engine does not start after three tries, notify unit maintenance.


GEAR SELECTOR

GO TO NEXT PAGE


TRANS OIL PRESS WARNING LIGHT
TRANS OIL PRESS

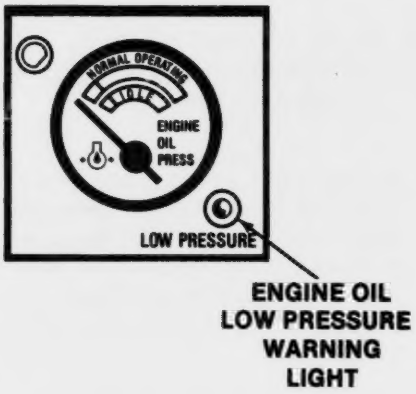
CAUTION

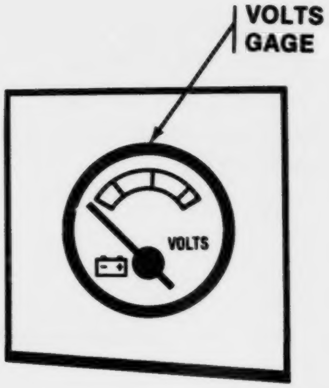
Power unit can get damaged. Stop engine if warning lights do not go off in 30 seconds.

NOTE

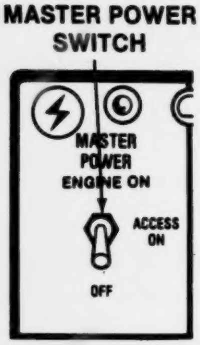
Engine speed may have to be increased above idle for TRANS OIL PRESS warning light to go off.

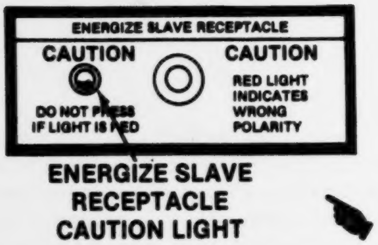
51. WHEN ENGINE STARTS, CHECK DRIVER'S INSTRUMENT PANEL.
    a. Check that TRANS OIL PRESS warning light goes off.
    b. Check that ENGINE OIL LOW PRESSURE warning light goes off.
    c. If TRANS OIL PRESS and ENGINE OIL LOW PRESSURE warning lights and warning tone do not go off within 30 seconds after engine is running, stop engine. Notify unit maintenance.
    d. Check that VOLTS gage pointer is in yellow or green zone.


NORMAL OPERATING
IDLE
ENGINE OIL PRESS
LOW PRESSURE
ENGINE OIL LOW PRESSURE WARNING LIGHT

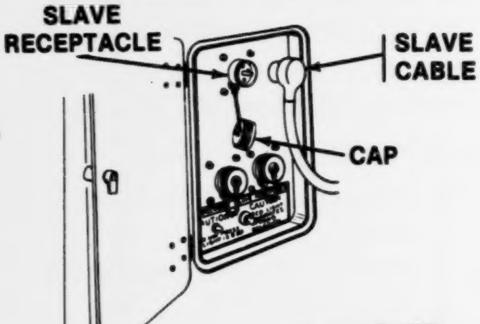

VOLTS GAGE
VOLTS

52. DEENERGIZE SLAVE RECEPTACLE ON APU AND DISABLED CARRIER.
    a. Turn off APU. Refer to proper operator's manual.
    b. Move MASTER POWER switch to OFF in disabled carrier.
    c. Check that ENERGIZE SLAVE RECEPTACLE CAUTION light in disabled carrier is off. If ENERGIZE SLAVE RECEPTACLE CAUTION light is not off, repeat substeps a and b above. If this fails, notify unit maintenance.


MASTER POWER SWITCH
MASTER POWER
ENGINE ON
ACCESS ON
OFF


ENERGIZE SLAVE RECEPTACLE
CAUTION
DO NOT PRESS IF LIGHT IS RED
CAUTION
RED LIGHT INDICATES WRONG POLARITY
ENERGIZE SLAVE RECEPTACLE CAUTION LIGHT

53. REMOVE SLAVE CABLE.
    a. Unplug slave cable from slave receptacle on carrier.
    b. Install cap on slave receptacle.
    c. Remove slave cable from APU.

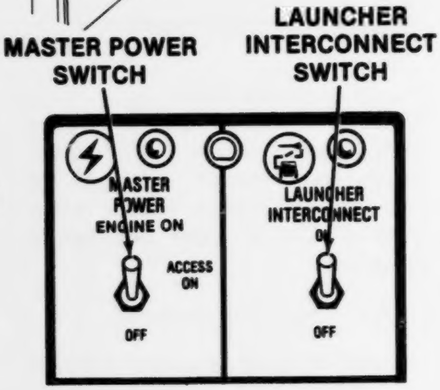

SLAVE RECEPTACLE
SLAVE CABLE
CAP

NOTE

If MASTER POWER switch is left OFF for more than 10 minutes while engine is running, the engine may run out of fuel.

54. MOVE MASTER POWER SWITCH TO ENGINE ON IN DISABLED CARRIER.

55. MOVE LAUNCHER INTERCONNECT SWITCH TO ON IN DISABLED CARRIER.


MASTER POWER SWITCH
LAUNCHER INTERCONNECT SWITCH
MASTER POWER
ENGINE ON
ACCESS ON
OFF
LAUNCHER INTERCONNECT
ON
OFF

END OF TASK

DRIVE CARRIER

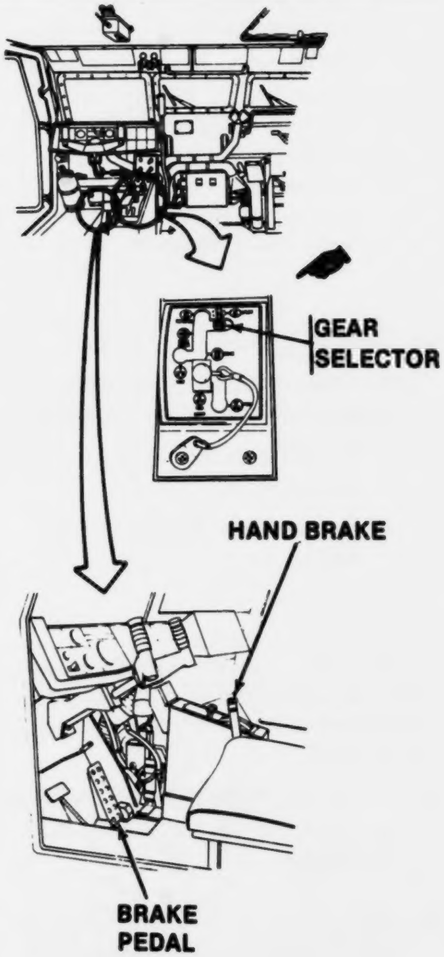
INITIAL SETUP

Personnel Required:

Driver
Ground guides (as required)

Equipment Conditions:

Engine started (page 2-123)



NOTE

A cold transmission can result in hesitation or minor inadvertent movement when transmission is engaged. Control any inadvertent movement with the foot brake.

DO'S AND DON'TS at end of task must be read before driving carrier.

1. RELEASE HAND BRAKE.
   a. Push down and hold brake pedal.
   b. Push hand brake forward and all the way down.
   c. Release foot pressure.

CAUTION

Removal of TOW START lockout during normal carrier operation can cause transmission damage. Do not remove lockout except when TOW START or TOW position is required.

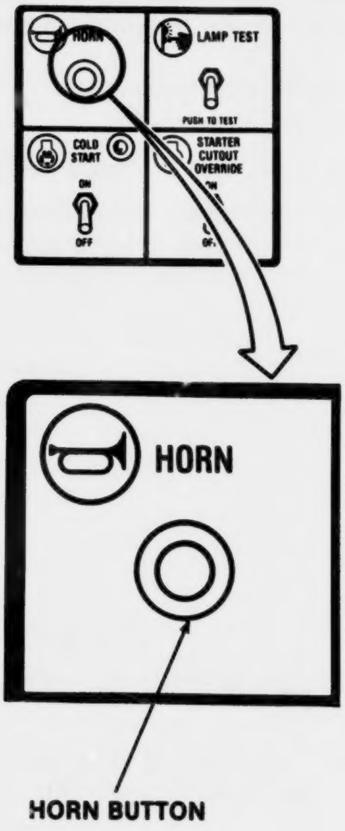
2. SET GEAR SELECTOR.
   a. Move gear selector from N (neutral) to desired position.

NOTE

If tactical situation permits, sound horn to warn soldiers carrier is about to move.

3. SOUND HORN.

   a. Press HORN button.


HORN
LAMP TEST
PUSH TO TEST
COLD START
ON
OFF
STARTER CUTOUT OVERRIDE
HORN
HORN BUTTON

WARNING

Carrier movement can throw you from your seat and injure you. Use of seat belts is mandatory.

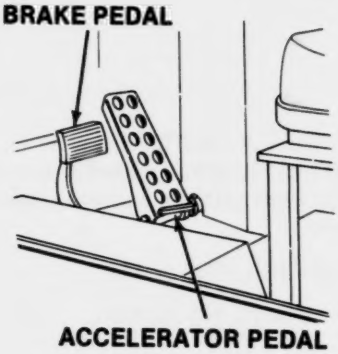
Carrier noise can cause permanent hearing damage. Double hearing protection must be worn. See warning in front of manual.

Sticking or failed linkages can cause carrier crash. Soldiers can be killed or injured. If accelerator pedal does not operate smoothly, or engine does not return to idle when accelerator pedal is released, do not drive carrier.

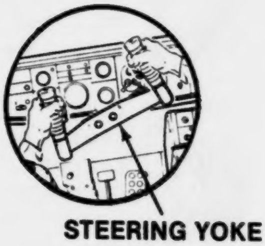
GO TO NEXT PAGE

NOTE

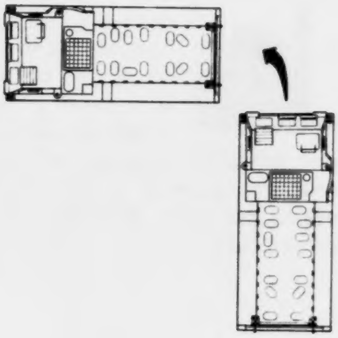
A cold transmission will result in a higher than normal throttle application for vehicle movement. If vehicle does not move out with throttle application, repeat transmission warm up.



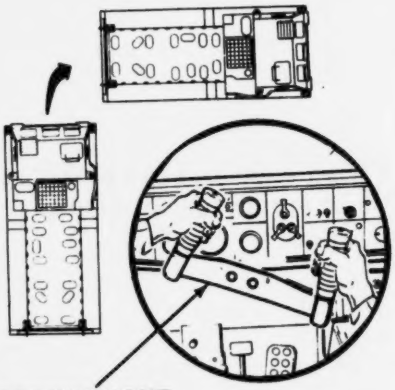
4. MOVE CARRIER AND CONTROL SPEED.
    a. Take foot off brake pedal.
    b. Put foot on accelerator pedal and slowly press down until carrier moves at speed you want.



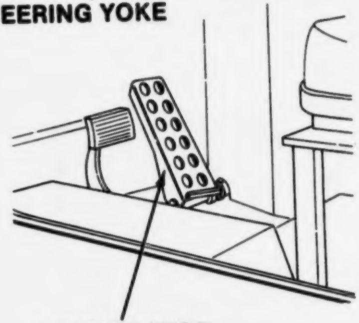
5. STEER CARRIER IN FORWARD RANGE.
    a. Turn steering yoke slowly to left to turn carrier left.



b. Turn steering yoke slowly to right to turn carrier right.



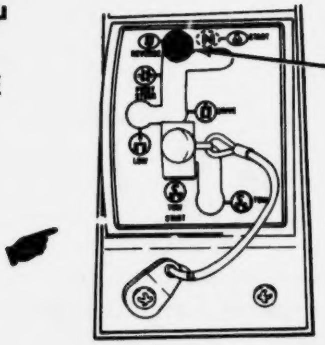
c. Press down on accelerator pedal as carrier turns to maintain speed.



WARNING

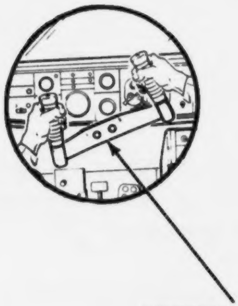
Operating carrier in reverse is dangerous due to limited vision and reversed steering. Carrier can crash. Soldiers can be injured or killed. Always post ground guides before you back up.

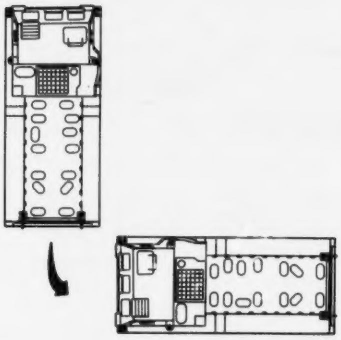
6. STEER CARRIER IN REVERSE (BACKING UP).
   a. Post ground guides.
   b. Move gear selector to REVERSE.



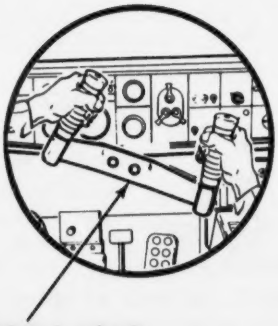
GO TO NEXT PAGE

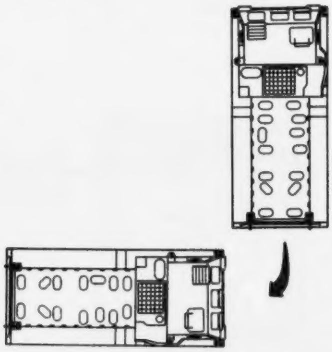
c. Turn steering yoke slowly to left to turn rear of carrier right.

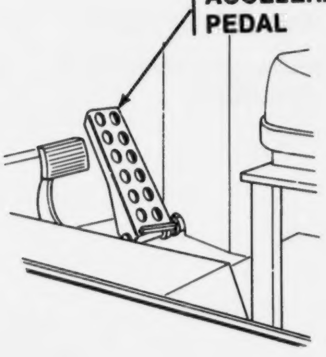

STEERING YOKE



d. Turn steering yoke slowly to right to turn rear of carrier left.


STEERING YOKE




ACCELERATOR PEDAL

e. Press down on accelerator pedal as carrier turns to maintain speed.

WARNING

Carrier will stop suddenly if steering yoke is released while pivot steering. Soldiers can be injured. Do not release steering yoke while pivot steering. Move steering yoke slowly to center.

CAUTION

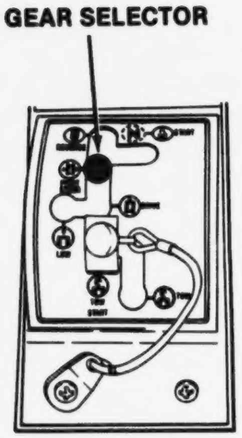
Track can come off when you pivot steer on soft soil or gravel. Avoid pivot steering on soft soil or gravel.

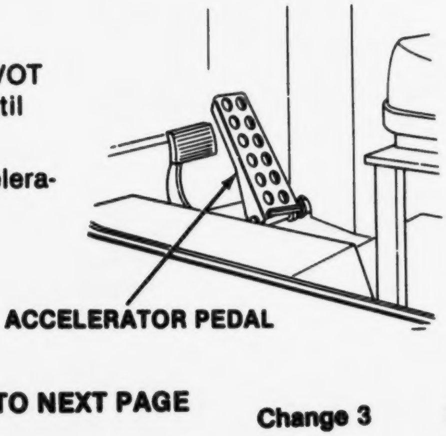
Power unit can be damaged. Do not pivot steer when carrier is moving.

NOTE

Use pivot steer only when normal turns cannot be made in close areas. Stop carrier before making pivot steer. After pivoting, backup carrier at least one carrier length to clear track.

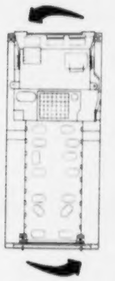
7. PIVOT STEER CARRIER.
   a. Move gear selector to PIVOT STEER and hold there until turn is completed.
   b. Press down hard on accelerator pedal.

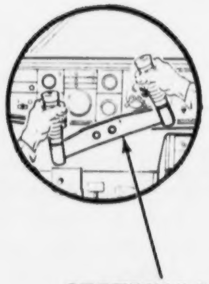




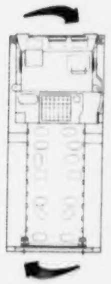
GO TO NEXT PAGE

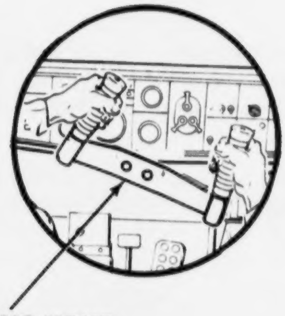
c. Turn steering yoke gradually to left to pivot left.




STEERING YOKE

d. Turn steering yoke gradually to right to pivot right.

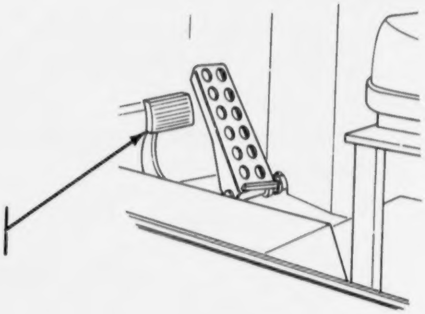



STEERING YOKE

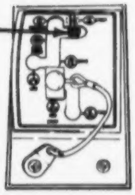
e. Center steering yoke gradually to stop pivot.

8. STOP CARRIER.

a. Press down on brake pedal with smooth, gradual pressure.


BRAKE PEDAL

b. Move gear selector to N (neutral).



DO'S AND DON'TS

DO

Wear lap safety belts.

Wear approved hearing protectors.

Wear CVC helmet or squad headset with helmet.

Secure all doors and hatches in position.

Keep an eye on your instruments. If you get an unusual reading, stop and check it out.

Warn crew if accelerator pedal or throttle jams. Unlock and pull FUEL handle to OFF, and stop carrier with brake pedal.

Observe traffic safety rules.

Be alert for hazards or objects blocking path of carrier.

Be alert to unusual sound or action of carrier.

Cross trenches squarely and keep steering yoke centered.

Approach objects blocking path of carrier squarely so both tracks touch object at same time.

Give carrier enough power so it will not stall on steep hills.

Hold carrier on steep hills with brakes.

Reduce speed at top of hills. Keep carrier in control when going down hills.

Just as you get to the bottom of steep hills, step on accelerator pedal. This lifts final drive assemblies from dirt and suspension does not bottom.

Turn carrier with a series of short turning motions when in loose dirt, dense mud, or snow.

Brake before a turn and keep power to tracks during turn.

GO TO NEXT PAGE

DON'T

Make sharp turns at high speeds.

Brake while turning.

Pull gear selector into TOW START when shifting from DRIVE to LOW.

Slide carrier sideways into loose dirt, dense mud, or snow.

Make continuous sharp turns in loose dirt, dense mud, or snow.

Drive over large objects. You could throw a track.

Cross a trench more than 7.5 feet (2.3 m) wide or climb walls higher than 30 inches (76 cm) high.

Drive on side slopes when conditions are slippery.

Break through large objects blocking path of carrier.

Hold carrier on steep slopes or hills with engine and transmission. Transmission could overheat.

Place gear selector in neutral until carrier has come to a complete stop.

Pull gear selector into TOW START when engine is running.

END OF TASK

STOP ENGINE

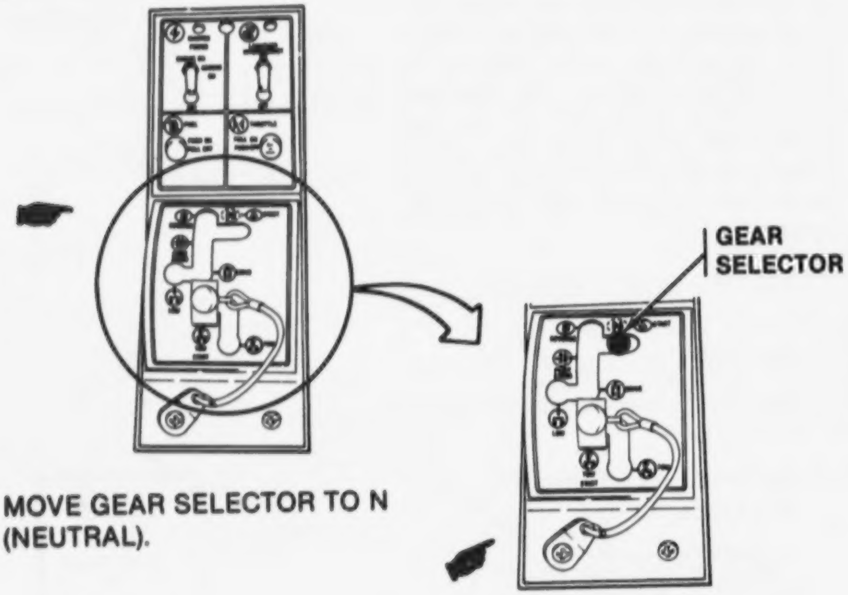
INITIAL SETUP

Personnel Required:

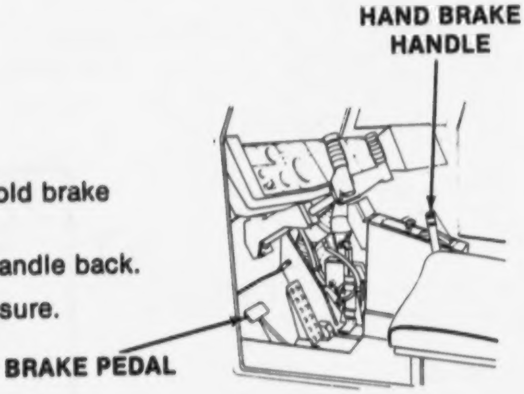
Driver

Equipment Conditions:

Engine started (page 2-123)


GEAR SELECTOR

1. MOVE GEAR SELECTOR TO N (NEUTRAL).


HAND BRAKE HANDLE
BRAKE PEDAL

2. SET HAND BRAKE.
   a. Push down and hold brake pedal.
   b. Pull hand brake handle back.
   c. Release foot pressure.

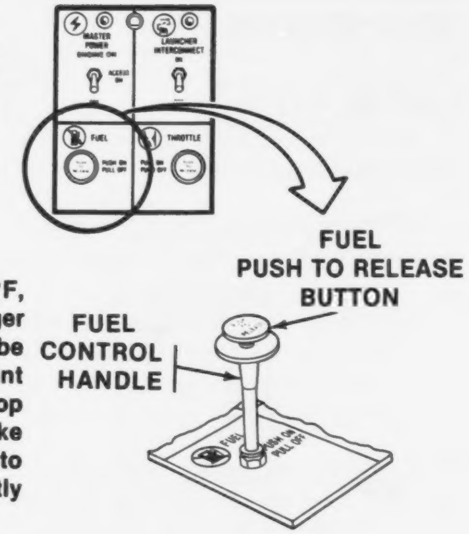
GO TO NEXT PAGE

CAUTION

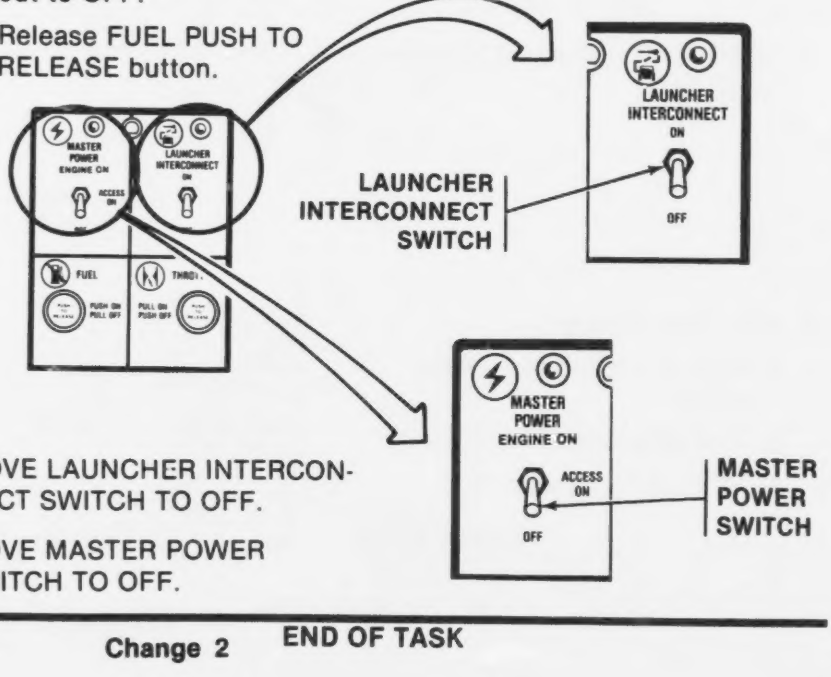
Stopping engine after carrier has just been run can damage engine. Unless directed by troubleshooting to stop engine immediately, let engine idle for 2 minutes. Idle engine until ENGINE COOLANT TEMP gage reads green zone.

NOTE

At ambient temperatures below 5°F, engine should not be idled any longer than necessary. Grille should be completely covered. If coolant temperature indicator is in top quarter of green zone, and intake grille is covered at shutdown, time to warm transmission will be greatly reduced.


MASTER POWER ENGINE ON
ACCESS ON
LAUNCHER INTERCONNECT ON
FUEL
PUSH ON PULL OFF
THROTTLE
FUEL PUSH TO RELEASE BUTTON
FUEL CONTROL HANDLE
FUEL
PUSH ON PULL OFF

3. TURN OFF FUEL CONTROL.
   a. Press FUEL PUSH TO RELEASE button.
   b. Pull FUEL handle all the way out to OFF.
   c. Release FUEL PUSH TO RELEASE button.


MASTER POWER ENGINE ON
ACCESS ON
LAUNCHER INTERCONNECT ON
FUEL
PUSH ON PULL OFF
THROTTLE
PULL ON PUSH OFF
LAUNCHER INTERCONNECT ON
OFF
LAUNCHER INTERCONNECT SWITCH
MASTER POWER ENGINE ON
ACCESS ON
OFF
MASTER POWER SWITCH

4. MOVE LAUNCHER INTERCONNECT SWITCH TO OFF.
5. MOVE MASTER POWER SWITCH TO OFF.

END OF TASK

FUEL CARRIER

INITIAL SETUP

Materials/Parts:

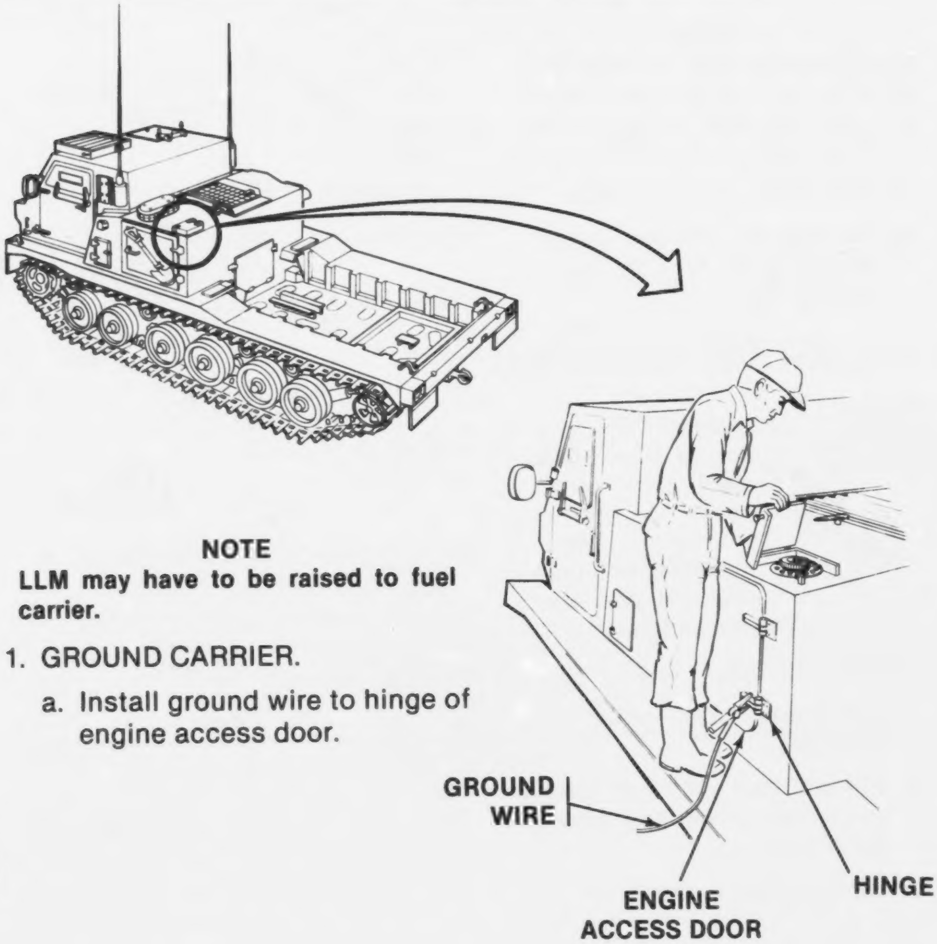
Wiping rag (Item 11, App D)

Equipment Conditions:

Engine stopped (page 2-167)

Personnel Required:

Driver

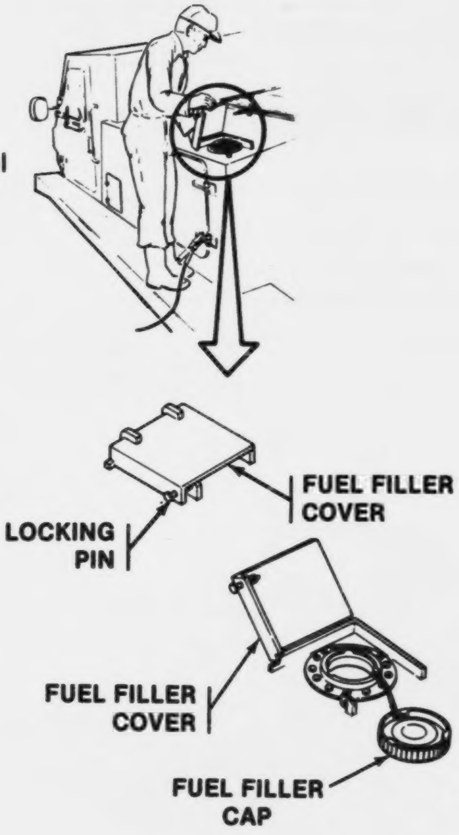

GROUND WIRE
ENGINE ACCESS DOOR
HINGE

NOTE

LLM may have to be raised to fuel carrier.

1. GROUND CARRIER.
   a. Install ground wire to hinge of engine access door.

GO TO NEXT PAGE


LOCKING PIN
FUEL FILLER COVER
FUEL FILLER COVER
FUEL FILLER CAP

2. OPEN FUEL FILLER COVER.
    a. Pull locking pin and open fuel filler cover.
    b. Release locking pin.

CAUTION

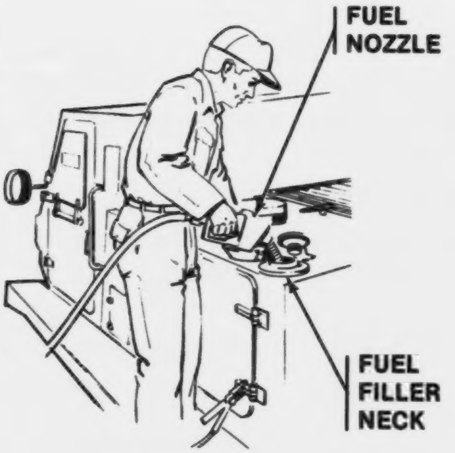
Contamination can damage fuel system. Remove dirt and water from fuel filler area before opening fuel filler cap.

3. CLEAN FUEL FILLER AREA.
    a. Remove any dirt and water around fuel filler cap. Use wiping rag.

4. UNSCREW FUEL FILLER CAP.

WARNING

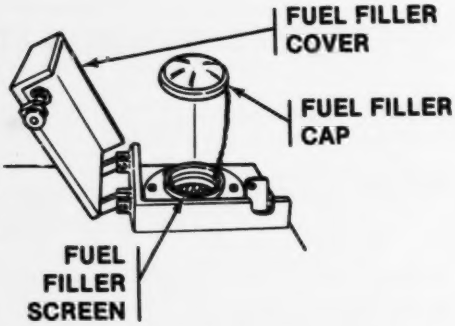
Sparks from static electricity could cause a fire or explosion. Metal nozzle must touch metal in fuel filler neck when fuel is running.

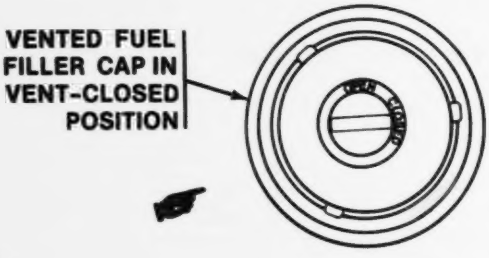

FUEL NOZZLE
FUEL FILLER NECK

5. FUEL CARRIER.
    a. Insert fuel nozzle in fuel filler neck.
    b. Fill fuel tank until fuel level is at bottom of fuel filler screen. Do not top off.
    c. Remove fuel nozzle.

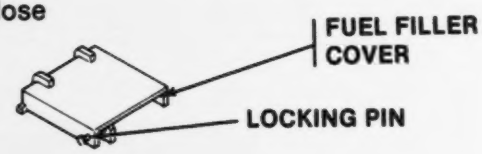
NOTE
There are several available types of fuel caps. Be sure vented caps are kept in closed position.

6. SCREW ON FUEL FILLER CAP.
   a. Make sure adjustable vented fuel filler cap is in vent-closed position.

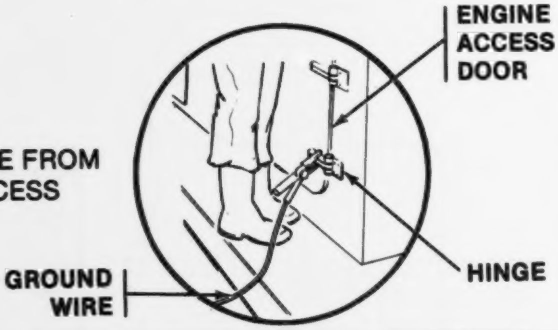

FUEL FILLER COVER
FUEL FILLER CAP
FUEL FILLER SCREEN


VENTED FUEL FILLER CAP IN VENT-CLOSED POSITION
OPEN
CLOSED

7. CLOSE FUEL FILLER COVER.
   a. Pull out locking pin and close fuel filler cover.
   b. Release locking pin.


FUEL FILLER COVER
LOCKING PIN

8. REMOVE GROUND WIRE FROM HINGE ON ENGINE ACCESS DOOR.


ENGINE ACCESS DOOR
HINGE
GROUND WIRE

END OF TASK

OPERATE SUSPENSION LOCKOUT

DESCRIPTION

This task covers: Engage Suspension Lockout (page 2-172).
Disengage Suspension Lockout (page 2-174).

INITIAL SETUP

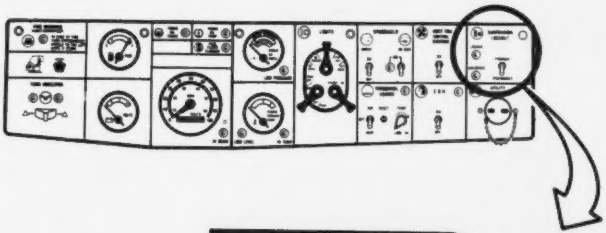
Personnel Required:

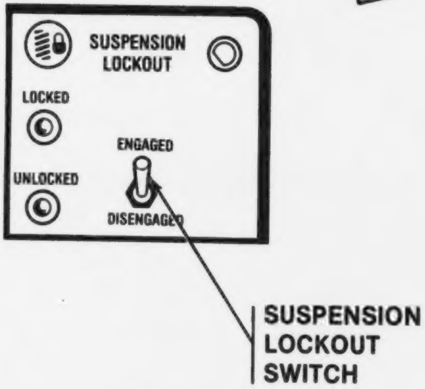
Driver

Equipment Conditions:

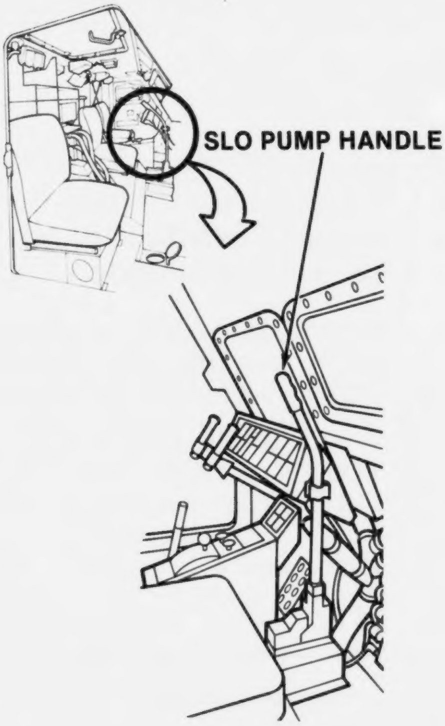
Gear selector in N (neutral)
Hand brake set (page 2-167)
Carrier parked on level surface
Engine running (page 2-123)

ENGAGE SUSPENSION LOCKOUT




SUSPENSION LOCKOUT
LOCKED
UNLOCKED
ENGAGED
DISENGAGED
SUSPENSION LOCKOUT SWITCH

1. MOVE SUSPENSION LOCKOUT SWITCH TO ENGAGED.



SLO PUMP HANDLE

NOTE

SLO pump handle will give resistance on upward and downward stroke until pressure is built up in suspension lockout system. After pressure is built up, handle will give resistance only on the downstroke.

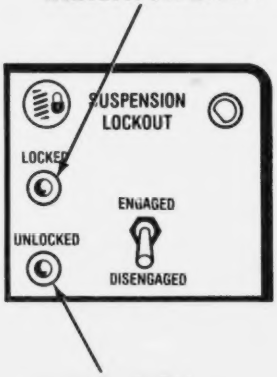
2. PUMP SLO PUMP HANDLE BACK AND FORTH UNTIL SUSPENSION LOCKOUT LOCKED INDICATOR LIGHT GOES ON AND SUSPENSION LOCKOUT UNLOCKED INDICATOR LIGHT GOES OUT.

    a. If you have resistance on the upstroke, move SLO pump handle down slightly before pushing forward. Resistance on the upstroke should stop.

    b. IF SUSPENSION LOCKOUT LOCKED indicator light goes out, you have overpressurized suspension lockout system. Try again.

    c. IF SUSPENSION LOCKOUT LOCKED indicator light continues to go out, notify organizational maintenance.

SUSPENSION LOCKOUT LOCKED INDICATOR LIGHT



SUSPENSION LOCKOUT UNLOCKED INDICATOR LIGHT

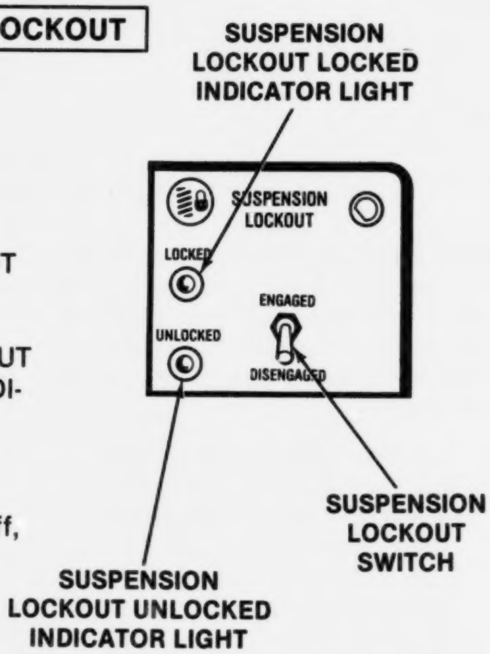
GO TO NEXT PAGE

DISENGAGE SUSPENSION LOCKOUT

3. MOVE SUSPENSION LOCKOUT SWITCH TO DISENGAGED.

4. CHECK SUSPENSION LOCKOUT LOCKED AND UNLOCKED INDICATOR LIGHTS.

   a. If SUSPENSION LOCKOUT LOCKED and UNLOCKED indicator lights do not go off, notify organizational maintenance.

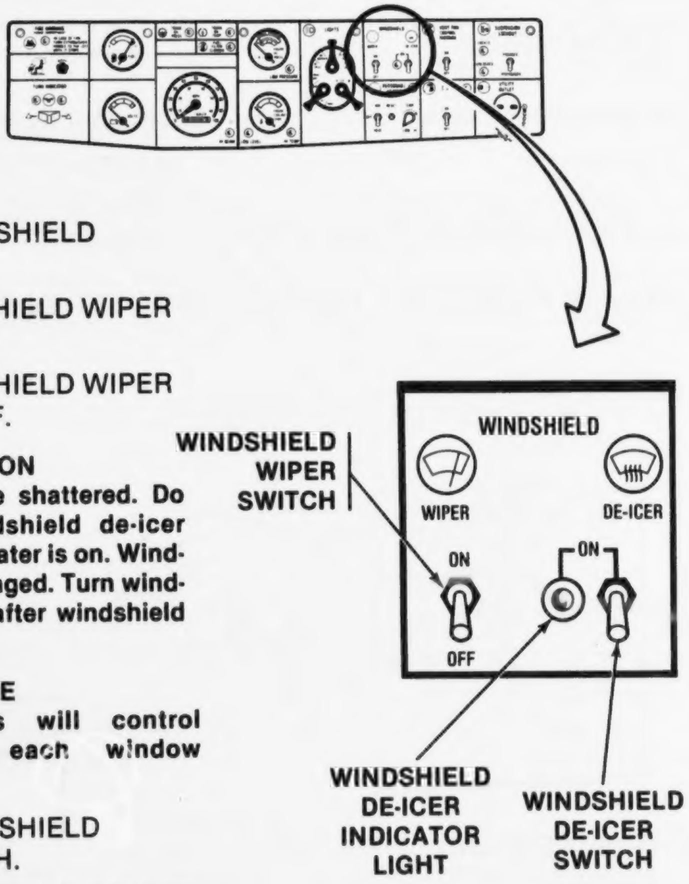

SUSPENSION LOCKOUT LOCKED INDICATOR LIGHT
SUSPENSION LOCKOUT
LOCKED
ENGAGED
UNLOCKED
DISENGAGED
SUSPENSION LOCKOUT SWITCH
SUSPENSION LOCKOUT UNLOCKED INDICATOR LIGHT

END OF TASK

OPERATE WINDSHIELD WIPERS AND DE-ICER

INITIAL SETUP

Personnel Required:	Equipment Conditions:
Driver	MASTER POWER switch at ENGINE ON (page 2-2)


WINDSHIELD
WIPER
DE-ICER
ON
OFF
ON
WINDSHIELD WIPER SWITCH
WINDSHIELD DE-ICER INDICATOR LIGHT
WINDSHIELD DE-ICER SWITCH

1. OPERATE WINDSHIELD WIPERS.
   a. Move WINDSHIELD WIPER switch to ON.
   b. Move WINDSHIELD WIPER switch to OFF.

CAUTION

Windshield can be shattered. Do not operate windshield de-icer when personnel heater is on. Windshield can be damaged. Turn windshield de-icer off after windshield is clear.

NOTE

Heating elements will control temperature of each window automatically.

2. OPERATE WINDSHIELD DE-ICER SWITCH.
   a. Move WINDSHIELD DE-ICER switch to ON.
   b. Move WINDSHIELD DE-ICER switch to OFF.

END OF TASK

OPERATE PERSONNEL HEATER/DEFOGGER

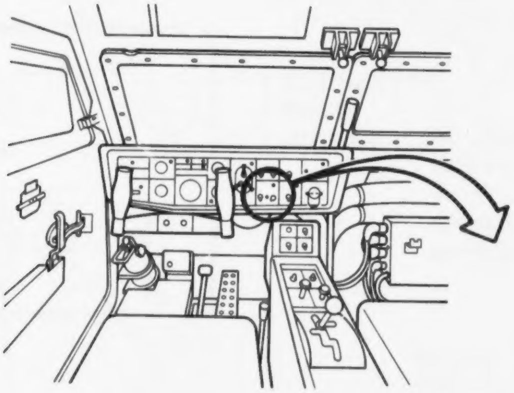
DESCRIPTION

This task covers: Operate Personnel Heater/Defogger in Fresh Air Mode (page 2-176). Operate Personnel Heater/Defogger in Heat Mode (page 2-177). Shut Down Personnel Heater/Defogger (page 2-179).

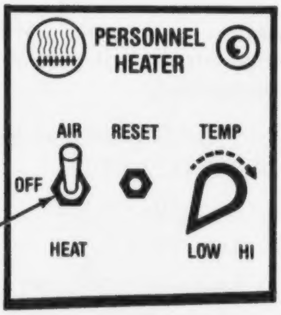
INITIAL SETUP

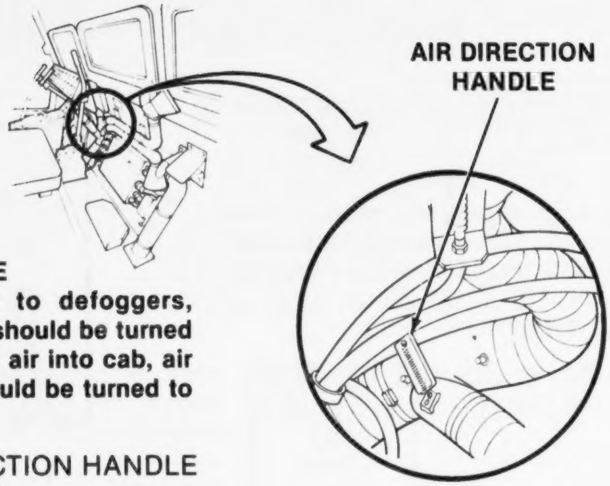
Personnel Required:	Equipment Conditions:
Driver	MASTER POWER switch at ENGINE ON (page 2-2)

OPERATE PERSONNEL HEATER/DEFOGGER IN FRESH AIR MODE



1. MOVE PERSONNEL HEATER AIR/HEAT SWITCH TO AIR.


PERSONNEL HEATER
AIR
RESET
TEMP
OFF
HEAT
LOW
HI
PERSONNEL HEATER AIR/HEAT SWITCH


AIR DIRECTION
HANDLE

NOTE

To force fresh air to defoggers, air direction handle should be turned to up. To force fresh air into cab, air direction handle should be turned to down.

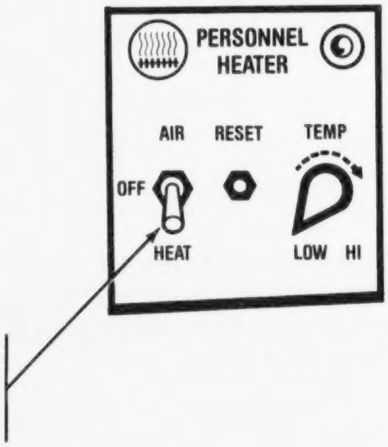
2. MOVE AIR DIRECTION HANDLE TO UP OR DOWN.

OPERATE PERSONNEL HEATER/DEFOGGER IN HEAT MODE

NOTE

If heater overheats, circuit breaker will automatically cut off power. After cooling period, press PERSONNEL HEATER RESET button to restore power.

3. MOVE PERSONNEL HEATER AIR/HEAT SWITCH TO HEAT.

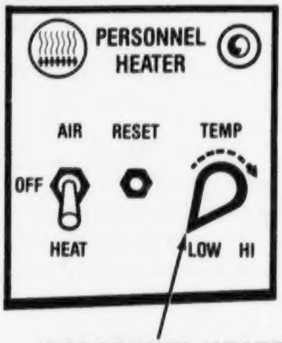

PERSONNEL
HEATER
AIR
RESET
TEMP
OFF
HEAT
LOW
HI
PERSONNEL
HEATER
AIR/HEAT
SWITCH

GO TO NEXT PAGE

NOTE

Heat from defoggers and cab heat outlets should be steady. Air temperature will increase when PERSONNEL HEATER TEMP switch is turned from LOW to HI.

4. TURN PERSONNEL HEATER TEMP SWITCH TO LOW OR HI.


PERSONNEL
HEATER
AIR
RESET
TEMP
OFF
HEAT
LOW
HI

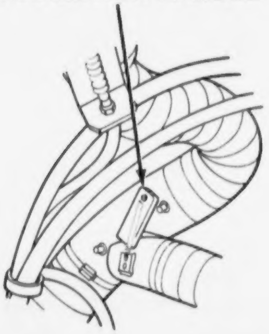
PERSONNEL HEATER TEMP SWITCH

CAUTION

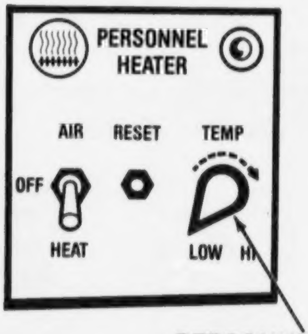
Do not leave PERSONNEL HEATER TEMP switch on HI setting, or heat from defogger vents may crack windshield glass.

5. WHEN WINDSHIELDS HAVE CLEARED, MOVE AIR DIRECTION HANDLE TO DOWN.

AIR DIRECTION HANDLE



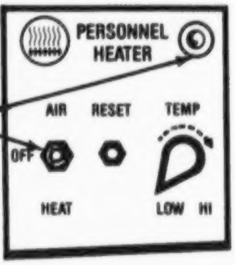
6. TURN PERSONNEL HEATER TEMP SWITCH BETWEEN LOW AND HI TO OBTAIN DESIRED TEMPERATURE.


PERSONNEL
HEATER
AIR
RESET
TEMP
OFF
HEAT
LOW
HI

PERSONNEL HEATER TEMP SWITCH

SHUT DOWN PERSONNEL HEATER/DEFOGGER

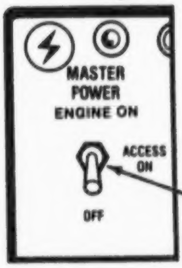
7. MOVE PERSONNEL HEATER AIR/HEAT SWITCH TO OFF.


PERSONNEL
HEATER
AIR
RESET
TEMP
OFF
HEAT
LOW
HI

PERSONNEL HEATER AIR/HEAT SWITCH AND INDICATOR LIGHT

NOTE

After heater air/heat switch has been turned to OFF position, the blower motor will continue to run, purging the remaining fuel from the heater. When all fuel has been burned and heater has cooled down, the indicator light will go out and blower motor will shut off.


MASTER
POWER
ENGINE ON
ACCESS
ON
OFF

MASTER POWER SWITCH

8. MOVE MASTER POWER SWITCH TO OFF.

END OF TASK

OPERATE VENTILATION SYSTEM

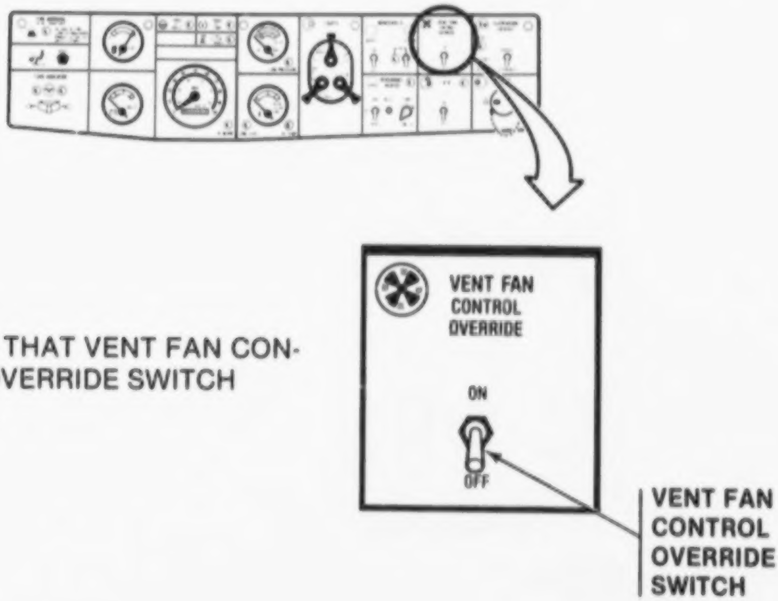
DESCRIPTION

This task covers: Operate Vent System During Normal Operations (page 2-180). Operate Vent System During Rocket Firing Operations (page 2-182). Override Vent System (page 2-183). Shut Down Vent System (page 2-183).

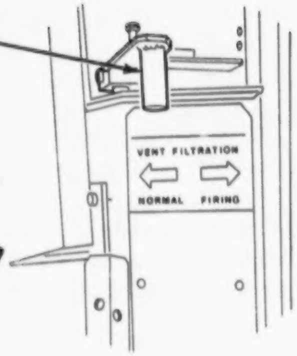
INITIAL SETUP

Personnel Required:	Equipment Conditions:
Soldier	MASTER POWER switch at ENGINE ON or ACCESS ON (page 2-2)

OPERATE VENT SYSTEM DURING NORMAL OPERATIONS


VENT FAN
CONTROL
OVERRIDE
ON
OFF
VENT FAN
CONTROL
OVERRIDE
SWITCH

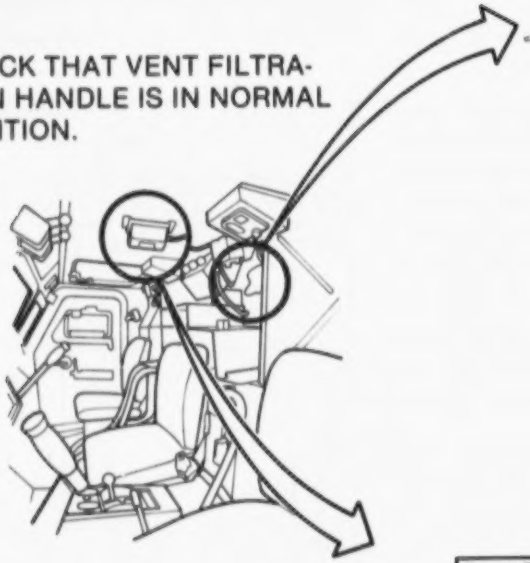
1. CHECK THAT VENT FAN CONTROL OVERRIDE SWITCH IS OFF.


VENT FILTRATION HANDLE
VENT FILTRATION
NORMAL
FIRING

NOTE

VENT FILTRATION handle should be in FIRING position for rocket firing only.

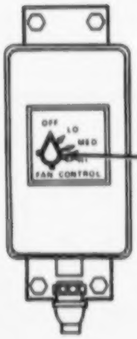
2. CHECK THAT VENT FILTRATION HANDLE IS IN NORMAL POSITION.



NOTE

Air flow from fan outlet duct increases as FAN CONTROL switch is moved to higher flow setting.

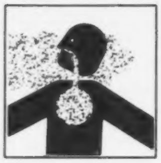
3. MOVE FAN CONTROL SWITCH FROM OFF TO LO, MED, OR HI.


OFF
LO
MED
HI
FAN CONTROL
FAN CONTROL SWITCH

GO TO NEXT PAGE

OPERATE VENT SYSTEM DURING ROCKET FIRING OPERATIONS

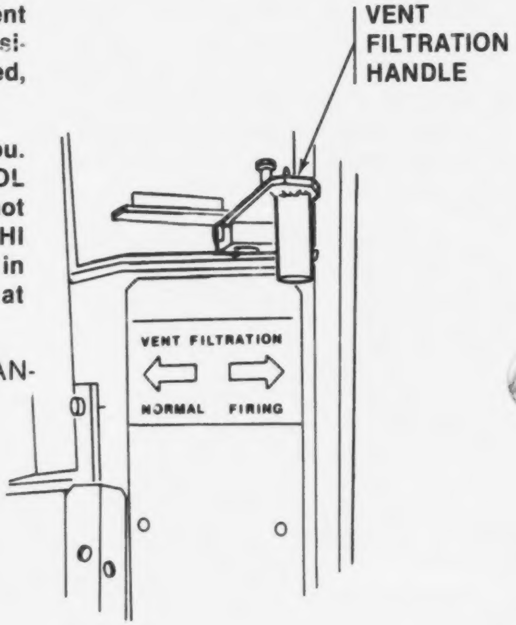
WARNING

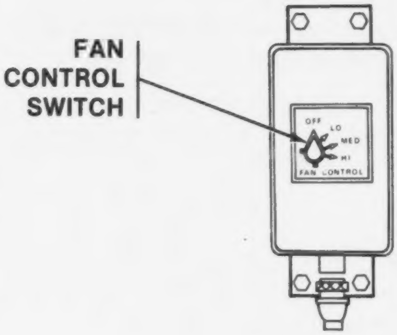


Rocket gases can poison you. Do not move VENT FAN CONTROL OVERRIDE switch to ON or do not move FAN CONTROL switch to HI when vent filtration handle is in FIRING position and rockets are being fired, except in an emergency.

Engine exhaust can poison you. Do not move VENT FAN CONTROL OVERRIDE switch to ON or do not move FAN CONTROL switch to HI when vent filtration handle is in FIRING position and engine is at fast idle.

4. MOVE VENT FILTRATION HANDLE TO FIRING POSITION.


VENT FILTRATION HANDLE
VENT FILTRATION
NORMAL
FIRING


FAN CONTROL SWITCH
OFF
LO
MED
HI
FAN CONTROL

NOTE

Air flow from fan outlet duct increases as FAN CONTROL switch is moved to higher flow setting.

5. MOVE FAN CONTROL SWITCH FROM OFF TO LO, TO MED.

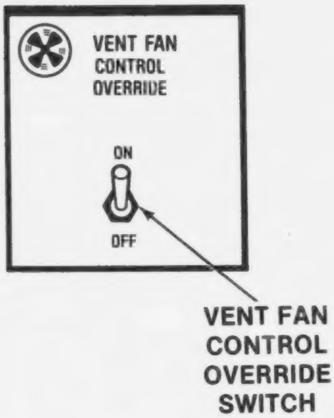
OVERRIDE VENT SYSTEM

NOTE

Step 6 should be done only if VENT FAN CONTROL OVERRIDE switch does not work. Do not use VENT FAN CONTROL OVERRIDE switch during rocket firing except in an emergency.

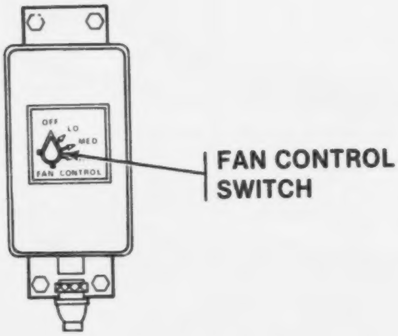
When VENT FAN CONTROL OVERRIDE switch is ON, air flow will equal that of HI setting on FAN CONTROL switch.

6. MOVE VENT FAN CONTROL OVERRIDE SWITCH TO ON.

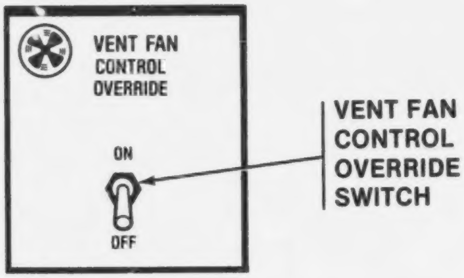

VENT FAN
CONTROL
OVERRIDE
ON
OFF
VENT FAN CONTROL OVERRIDE SWITCH

SHUT DOWN VENT SYSTEM

7. MOVE FAN CONTROL SWITCH TO OFF.


OFF
LO
MED
FAN CONTROL
FAN CONTROL SWITCH

8. MOVE VENT FAN CONTROL OVERRIDE SWITCH TO OFF.

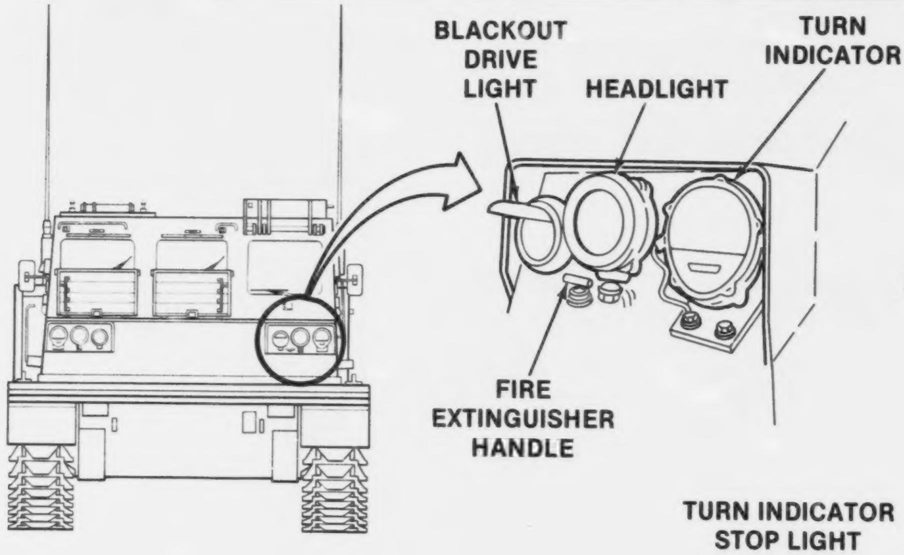

VENT FAN
CONTROL
OVERRIDE
ON
OFF
VENT FAN CONTROL OVERRIDE SWITCH

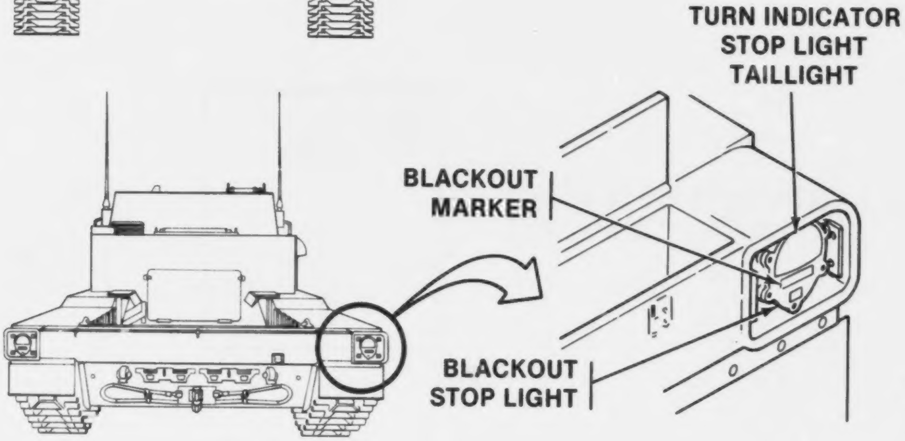
END OF TASK

OPERATE CARRIER LIGHTS

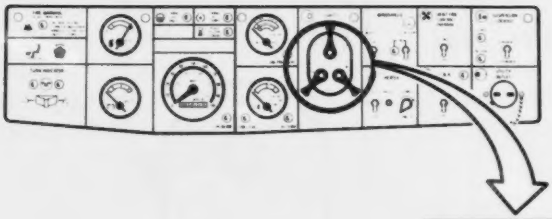
INITIAL SETUP

Personnel Required:	Equipment Conditions:
Driver	Engine stopped (page 2-167) MASTER POWER switch at ACCESS ON or ENGINE ON (page 2-2)


BLACKOUT DRIVE LIGHT
HEADLIGHT
TURN INDICATOR
FIRE EXTINGUISHER HANDLE


TURN INDICATOR STOP LIGHT TAILLIGHT
BLACKOUT MARKER
BLACKOUT STOP LIGHT

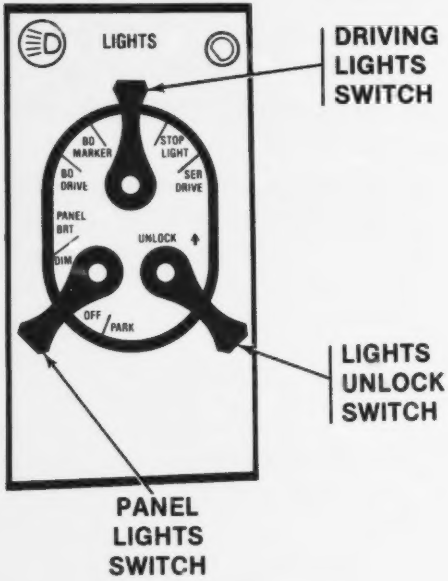
GO TO NEXT PAGE



NOTE

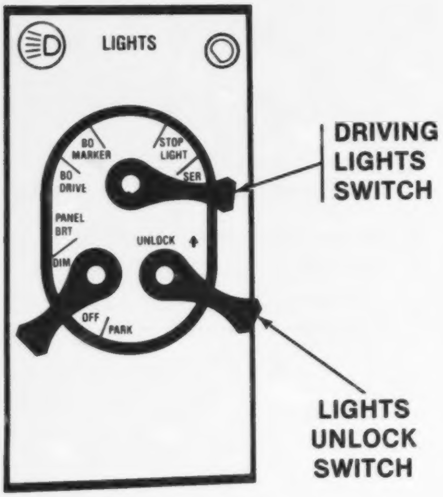
The LIGHTS UNLOCK switch is spring loaded. You do not need to use the LIGHTS UNLOCK switch when you move the DRIVING LIGHTS switch to BO MARKER.

For brake lights to come on, MASTER POWER switch must be in ENGINE ON or ACCESS ON, and DRIVING LIGHTS switch in STOP LIGHT or SER DRIVE.


LIGHTS
BO MARKER
STOP LIGHT
BO DRIVE
SER DRIVE
PANEL BRT
DIM
UNLOCK
OFF
PARK
DRIVING LIGHTS SWITCH
LIGHTS UNLOCK SWITCH
PANEL LIGHTS SWITCH

When DRIVING LIGHTS switch is in SER DRIVE position, headlights and taillights should come on. Rear stop lights should come on when brakes are applied.

1. OPERATE SER DRIVE.
   a. Move LIGHTS UNLOCK switch to unlock and hold.
   b. Move DRIVING LIGHTS switch to SER DRIVE.
   c. Release LIGHTS UNLOCK switch.

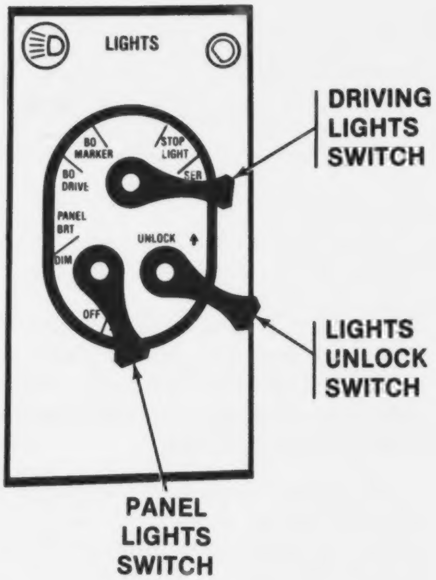

LIGHTS
BO MARKER
STOP LIGHT
BO DRIVE
SER
PANEL BRT
DIM
UNLOCK
OFF
PARK
DRIVING LIGHTS SWITCH
LIGHTS UNLOCK SWITCH

GO TO NEXT PAGE

NOTE

When operating parking lights, headlights should stay off. Taillights should come on. Stop lights should come on when brakes are applied.

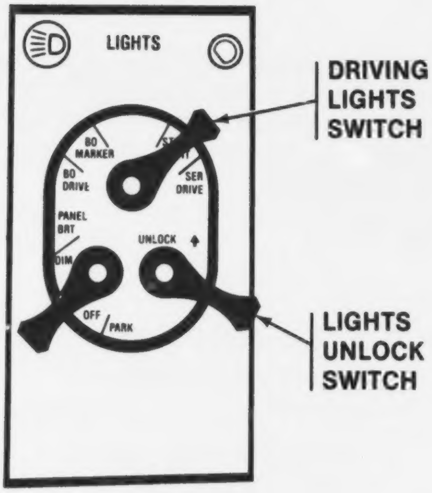
2. OPERATE REAR PARKING LIGHTS.
   a. Move LIGHTS UNLOCK switch to UNLOCK and hold.
   b. Move PANEL LIGHTS switch to PARK.
   c. Make sure DRIVING LIGHTS switch is in SER DRIVE.


LIGHTS
BO MARKER
STOP LIGHT
BO DRIVE
SER
PANEL BRT
UNLOCK
DIM
OFF
DRIVING LIGHTS SWITCH
LIGHTS UNLOCK SWITCH
PANEL LIGHTS SWITCH

NOTE

When operating stop lights, stop lights should come on when brakes are applied.

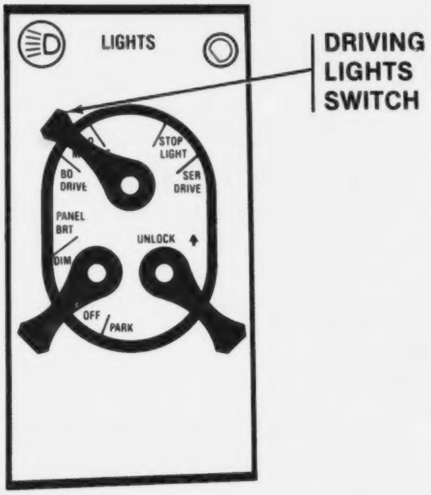
3. OPERATE STOP LIGHTS.
   a. Move LIGHTS UNLOCK switch to UNLOCK and hold.
   b. Move DRIVING LIGHTS switch to STOP LIGHT and release LIGHTS UNLOCK switch.


LIGHTS
BO MARKER
BO DRIVE
SER DRIVE
PANEL BRT
UNLOCK
DIM
OFF
PARK
DRIVING LIGHTS SWITCH
LIGHTS UNLOCK SWITCH

NOTE

When operating blackout marker lights, front and rear blackout marker lights should come on. Blackout stop light should come on when brakes are applied.

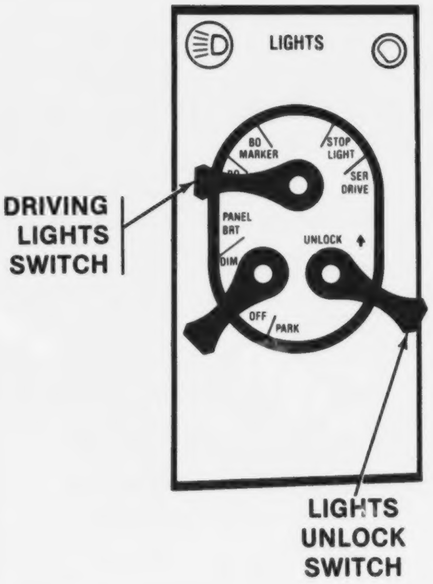
4. OPERATE BLACKOUT MARKER.
   a. Move DRIVING LIGHTS switch to BO MARKER position.


LIGHTS
STOP LIGHT
BO DRIVE
SER DRIVE
PANEL BRT
UNLOCK
DIM
OFF
PARK
DRIVING LIGHTS SWITCH

NOTE

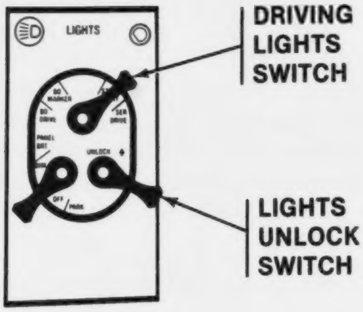
When operating blackout drive, blackout drive light should come on. Blackout marker front and rear lights should come on. Blackout stop lights should come on when brakes are applied.

5. OPERATE BLACKOUT DRIVE.
   a. Move LIGHTS UNLOCK switch to UNLOCK and hold.
   b. Move DRIVING LIGHTS switch to BO DRIVE.
   c. Release LIGHTS UNLOCK switch.

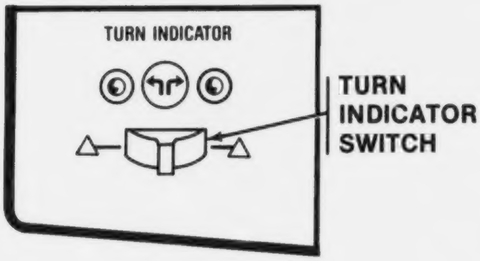

LIGHTS
BO MARKER
STOP LIGHT
SER DRIVE
PANEL BRT
UNLOCK
DIM
OFF
PARK
DRIVING LIGHTS SWITCH
LIGHTS UNLOCK SWITCH

GO TO NEXT PAGE

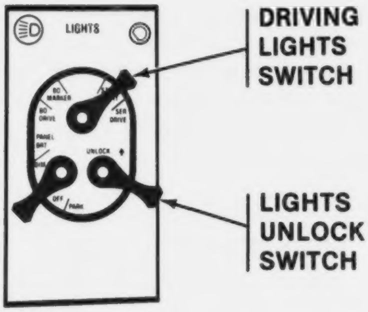
6. OPERATE RIGHT TURN INDICATOR.
   a. Move LIGHTS UNLOCK switch to UNLOCK and hold.
   b. Move DRIVING LIGHTS switch to STOP LIGHT or SER DRIVE.


LIGHTS
SER DRIVE
UNLOCK
OFF
PARK
DRIVING LIGHTS SWITCH
LIGHTS UNLOCK SWITCH

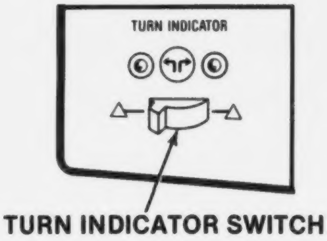
   c. Move TURN INDICATOR switch to right and stop at first click.


TURN INDICATOR
TURN INDICATOR SWITCH

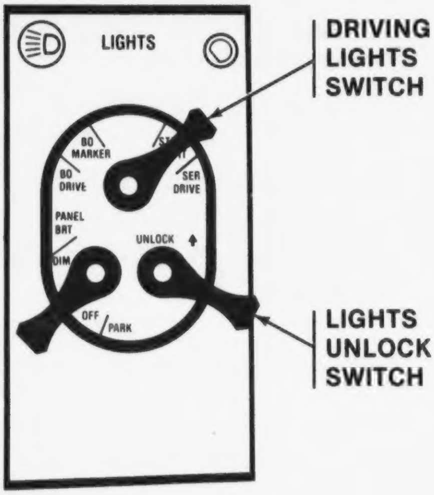
7. OPERATE LEFT TURN INDICATOR.
   a. Move LIGHTS UNLOCK switch to UNLOCK and hold.
   b. Move DRIVING LIGHTS switch to STOP LIGHT or SER DRIVE.


LIGHTS
SER DRIVE
UNLOCK
OFF
PARK
DRIVING LIGHTS SWITCH
LIGHTS UNLOCK SWITCH

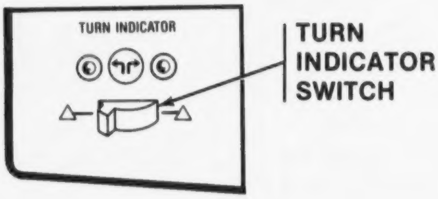
   c. Move TURN INDICATOR switch to left and stop at first click.


TURN INDICATOR
TURN INDICATOR SWITCH

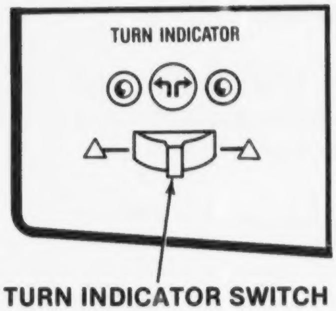
8. OPERATE HAZARD LIGHTS.
   a. Move LIGHTS UNLOCK switch to UNLOCK and hold.
   b. Move DRIVING LIGHTS switch to STOP LIGHT or SER DRIVE.


LIGHTS
BO MARKER
BO DRIVE
PANEL BRT
DIM
OFF
PARK
SER DRIVE
UNLOCK
DRIVING LIGHTS SWITCH
LIGHTS UNLOCK SWITCH

   c. Move TURN INDICATOR switch all the way left or right.

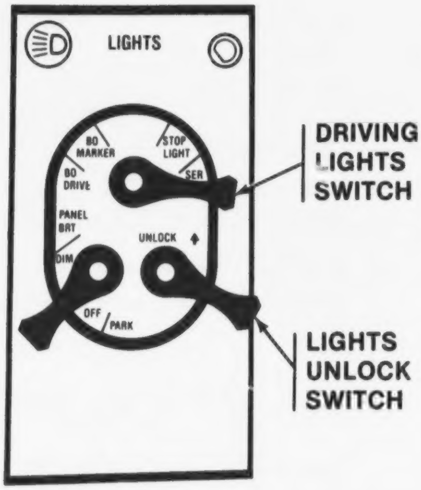

TURN INDICATOR
TURN INDICATOR SWITCH

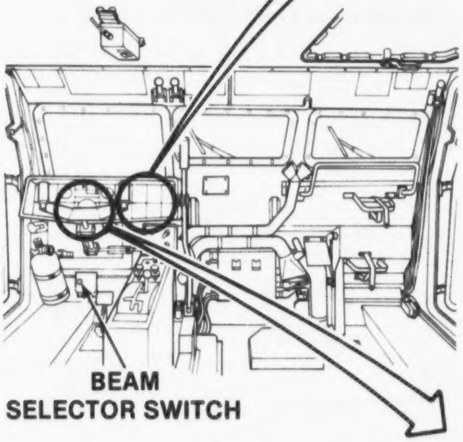
9. CANCEL TURN INDICATORS OR HAZARD LIGHTS.
   a. Move TURN INDICATOR switch to center.

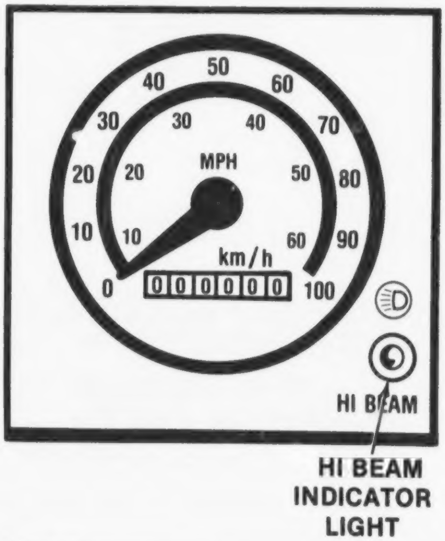

TURN INDICATOR
TURN INDICATOR SWITCH

GO TO NEXT PAGE

10. OPERATE HEADLIGHTS HI AND LOW BEAMS.
    a. Move LIGHTS UNLOCK switch to UNLOCK and hold.
    b. Move DRIVING LIGHTS switch to SER DRIVE.
    c. Release LIGHTS UNLOCK switch.


LIGHTS
BO MARKER
STOP LIGHT
BO DRIVE
SER
PANEL BRT
UNLOCK
DIM
OFF
PARK
DRIVING LIGHTS SWITCH
LIGHTS UNLOCK SWITCH


BEAM SELECTOR SWITCH


0
10
20
30
40
50
60
70
80
90
100
MPH
km/h
000000
HI BEAM
HI BEAM INDICATOR LIGHT

NOTE

When operating BEAM SELECTOR switch, HI BEAM indicator light should come on when carrier high beam lights come on.

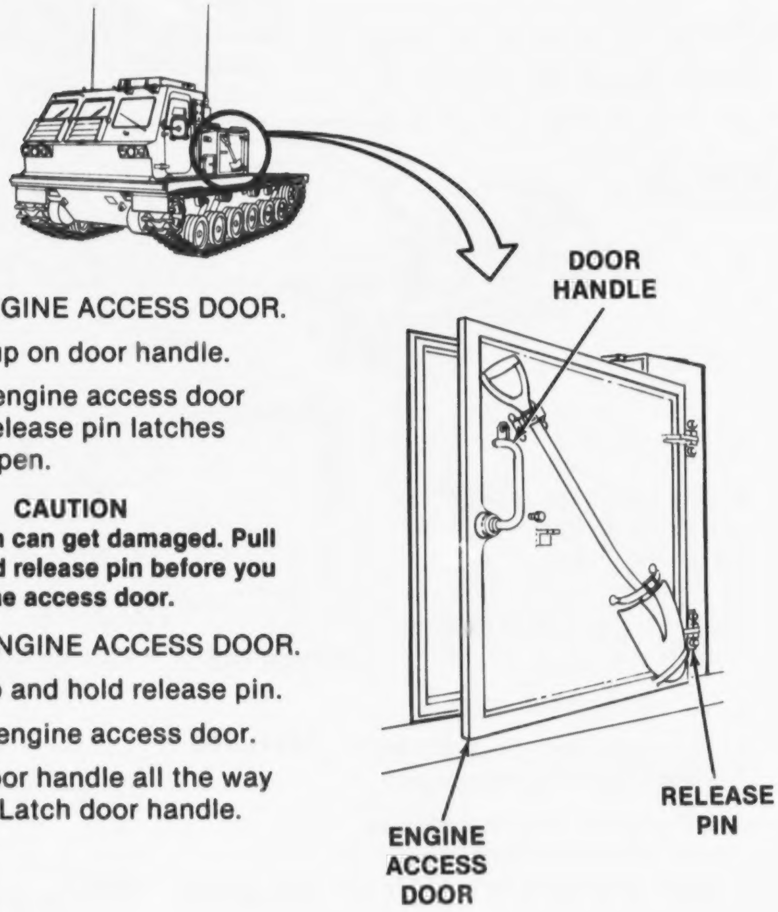
d. Push BEAM SELECTOR switch in and out for HI and LOW beam operation.

END OF TASK

OPEN/CLOSE ENGINE ACCESS DOOR

INITIAL SETUP

Personnel Required:	Equipment Conditions:
Driver	Engine stopped (page 2-167) Hand brake set (page 2-167) MASTER POWER switch OFF (page 2-2)



1. OPEN ENGINE ACCESS DOOR.
   a. Push up on door handle.
   b. Open engine access door until release pin latches door open.

CAUTION

Release pin can get damaged. Pull up and hold release pin before you close engine access door.

2. CLOSE ENGINE ACCESS DOOR.
   a. Pull up and hold release pin.
   b. Close engine access door.
   c. Pull door handle all the way down. Latch door handle.

END OF TASK

REMOVE/INSTALL ENGINE ACCESS COVER

DESCRIPTION

This task covers: Remove (page 2-192). Install (page 2-193).

INITIAL SETUP

Personnel Required:

Driver

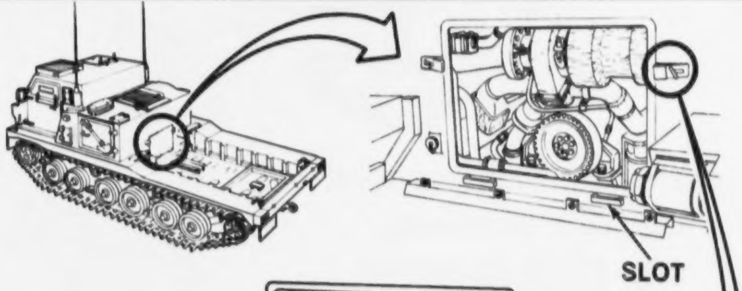
Reference:

TM 9-1425-646-10

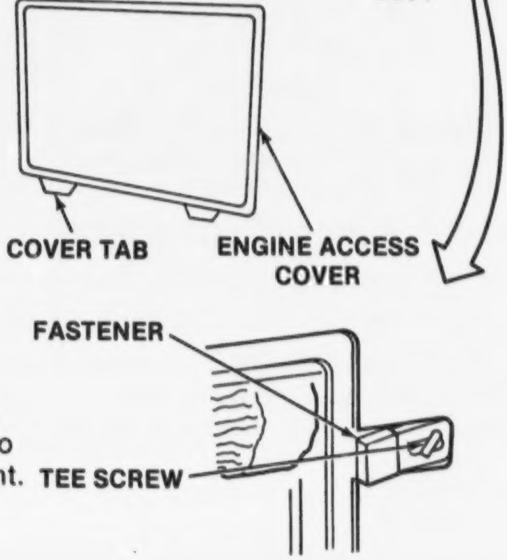
Equipment Conditions:

Engine stopped (page 2-167)
Hand brake set
MASTER POWER switch OFF (page 2-2)

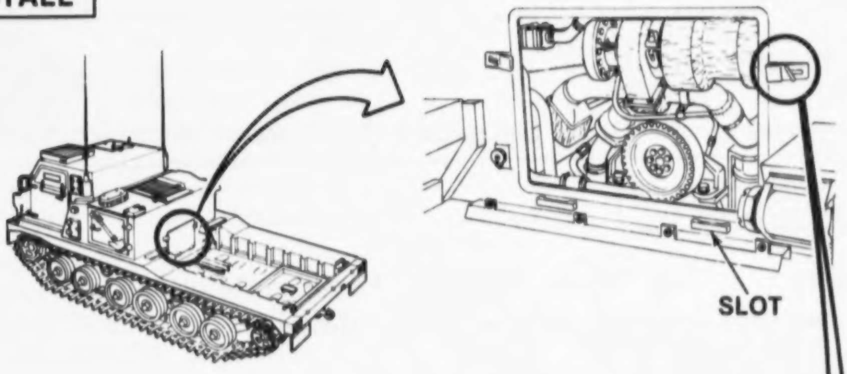
REMOVE



1. RAISE AND TRAVERSE LAUNCHER. See TM 9-1425-646-10.
2. REMOVE ENGINE ACCESS COVER.
   a. Loosen two tee screws.
   b. Push two fasteners out to clear engine access cover.
   c. Lift engine access cover so that two cover tabs clear two slots on engine compartment.

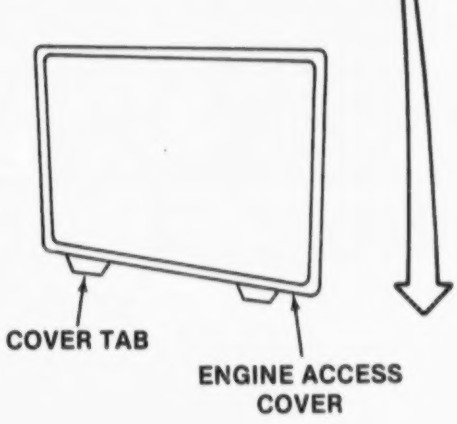


INSTALL



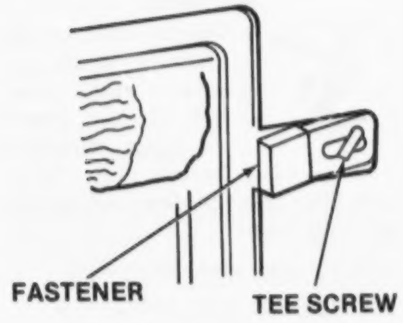
3. INSTALL ENGINE ACCESS COVER.

   a. Insert two cover tabs into two slots on engine compartment.


COVER TAB
ENGINE ACCESS COVER

   b. Push two fasteners in to hold engine access cover.

   c. Tighten two tee screws.


FASTENER
TEE SCREW

4. STOW LAUNCHER. See TM 9-1425-646-10.

END OF TASK

RAISE/LOWER CAB

DESCRIPTION

This task covers: Raise Cab (page 2-194). Lower Cab (page 2-198.1).

INITIAL SETUP

Tools:

Ratchet handle, 1/2 inch drive
(Item 24, App B)
Extension, 5 inch
(Item 14, App B)
Socket, 9/16 inch
(Item 41, App B)
Socket, 3/4 inch
(Item 43, App B)

Personnel Required:

Driver

Equipment Conditions:

Engine stopped (page 2-167)
Carrier parked on level surface

RAISE CAB

WARNING

Doors can swing open and injure you when you raise cab. Secure doors in open position before you raise cab. Stay clear of doors when cab is being raised.

1. OPEN AND SECURE COMMANDER'S AND DRIVER'S DOORS. See task: OPEN/CLOSE PERSONNEL DOORS AND DOOR ASSEMBLIES, page 2-94.

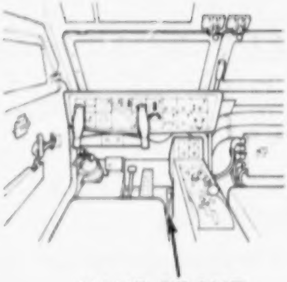
WARNING

Hatch cover could fall and injure you. Keep hands clear when you open or close cover. Make sure hatch is latched and secure when in the OPEN, POPPED or CLOSED position.

2. CHECK THAT COMMANDER'S HATCH IS SECURED. See task: OPEN/CLOSE COMMANDER'S HATCH COVER, page 2-101.

CAUTION

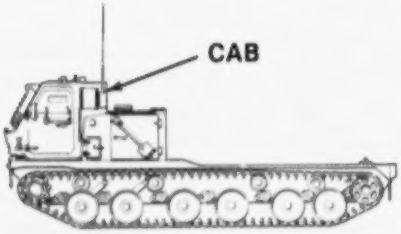
Hand brake could be damaged. Check that hand brake is set before trying to raise cab.



3. CHECK THAT HAND BRAKE IS SET.
   a. If hand brake is not set, set hand brake.

CAUTION

Loose equipment could be damaged. Check that all loose equipment is stowed inside cab when raising cab.



4. CHECK THAT ALL LOOSE EQUIPMENT IS STOWED INSIDE CAB.
   a. Stow or remove any loose equipment inside cab.

GO TO NEXT PAGE

WARNING

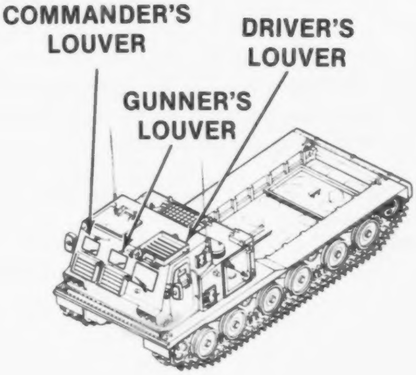
Equipment could fall off cab. Soldiers could be killed or injured. Check that no equipment is left on top of cab.

5. CHECK THAT NO ITEMS ARE ON TOP OF CAB.

WARNING

Louvers can swing down and kill or injure you when you raise cab. Make sure locking pin secures louvers. Stay clear of louvers when cab is being raised.

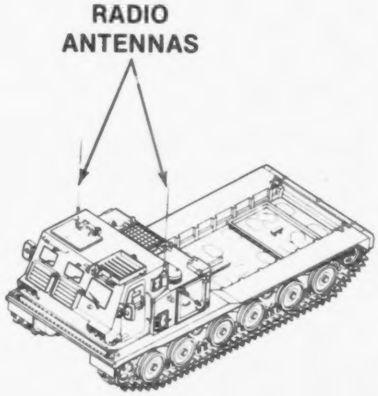
6. CHECK THAT LOUVERS ARE SECURED.
   a. If louvers are not secured, secure them. See task: OPERATE LOUVERS, page 2-104.



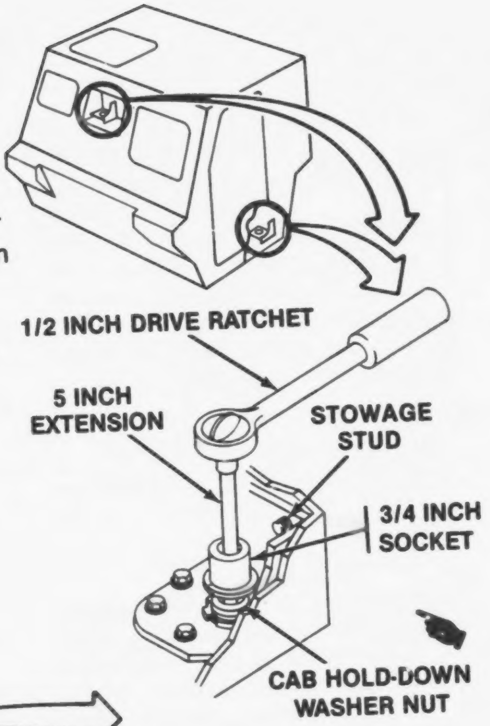
WARNING

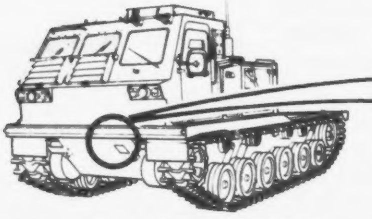
Radio antennas could touch high tension wires or other objects. Soldiers could be killed or injured. Check that antennas have clearance when raising cab.

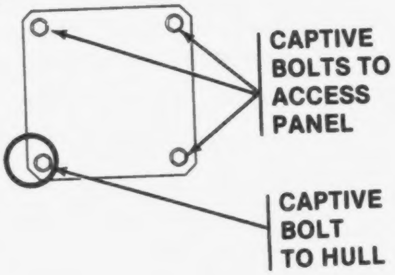
7. CHECK THAT RADIO ANTENNAS WILL HAVE CLEARANCE WHEN RAISING CAB.



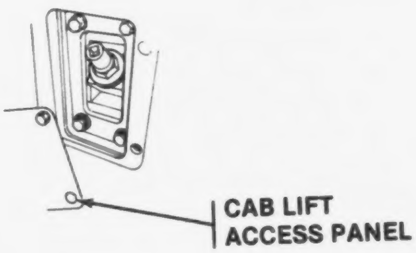
8. REMOVE TWO CAB HOLD-DOWN WASHER NUTS.
   a. Remove two cab hold-down washer nuts at right rear and left rear of cab floor. Use 1/2 inch drive ratchet, 5 inch extension, and 3/4 inch socket.
   b. Install cab hold-down washer nuts on stowage studs.


1/2 INCH DRIVE RATCHET
5 INCH EXTENSION
STOWAGE STUD
3/4 INCH SOCKET
CAB HOLD-DOWN WASHER NUT




CAPTIVE BOLTS TO ACCESS PANEL
CAPTIVE BOLT TO HULL

9. OPEN CAB LIFT ACCESS PANEL.
   a. Completely loosen three bolts that are captive to the cab lift access panel. Use 1/2 inch drive ratchet, 5 inch extension, and 9/16 inch socket.
   b. Completely loosen bolt that is captive to the hull. Use 1/2 inch drive ratchet, 5 inch extension, and 9/16 inch socket.
   c. Swing cab lift access panel down.

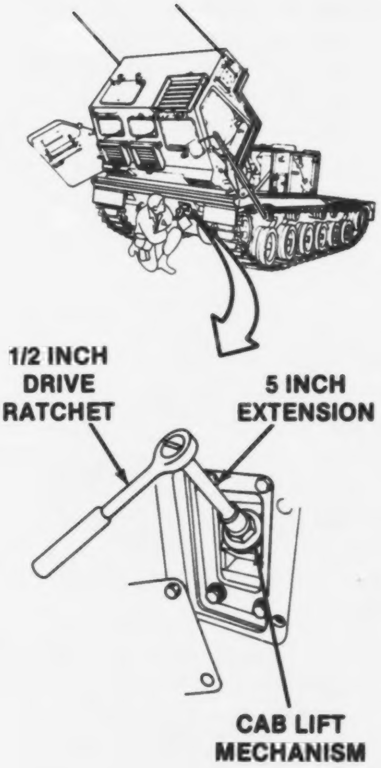

CAB LIFT ACCESS PANEL

GO TO NEXT PAGE

WARNING

Raising the cab using power tools or torque multipliers can allow cab to lift up very fast. Cab lift mechanism can be damaged. Personnel can be injured. Do not use power tools or torque multipliers to raise cab.

10. INSTALL 1/2 INCH DRIVE RATCHET AND 5 INCH EXTENSION IN CAB LIFT MECHANISM.



WARNING

Cab can fall back and crush soldiers when it is not fully raised and secured in forward position. Make sure to fully raise cab and secure it in forward position in safety strut with quick release pin.

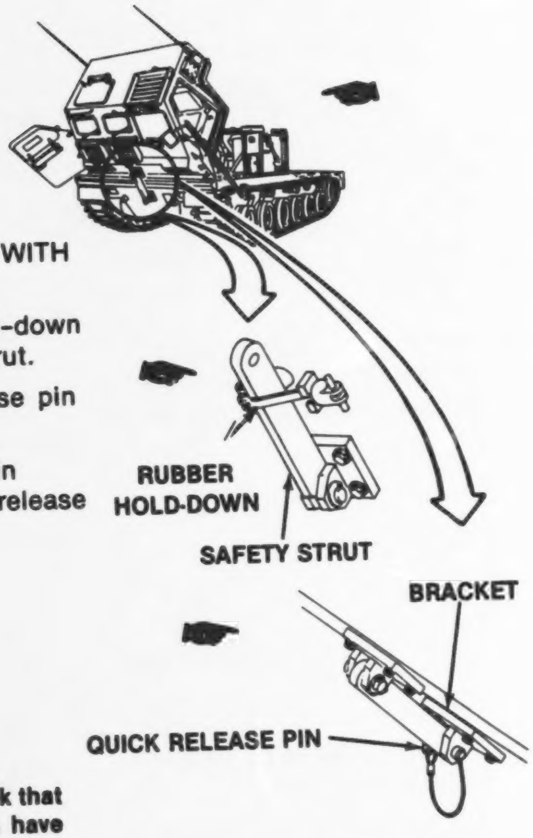
11. RAISE CAB.
    a. Turn ratchet to left.
    b. Raise cab as far as it will go until resistance is felt by cab lift mechanism. Then back off ratchet 1/4 turn.
    c. Remove 1/2 inch drive ratchet handle and 5 inch extension from cab lift mechanism.

11.1. SECURE RAISED CAB WITH SAFETY STRUT.

a. Release rubber hold-down and lower safety strut.

b. Remove quick release pin from bracket.

c. Install safety strut in bracket with quick release pin.


RUBBER HOLD-DOWN
SAFETY STRUT
BRACKET
QUICK RELEASE PIN

LOWER CAB

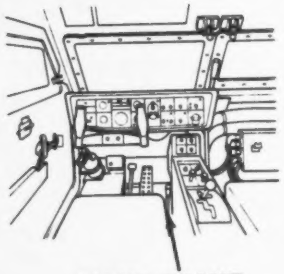
CAUTION

Carrier can be damaged. Check that all tools and foreign objects have been removed from engine compartment.

Loose or worn screws can cause damage to the cab lift mechanism. Visually inspect the cab lift mechanism before lowering cab.

12. CHECK THAT HAND BRAKE IS SET.

a. If hand brake is not set, set hand brake.



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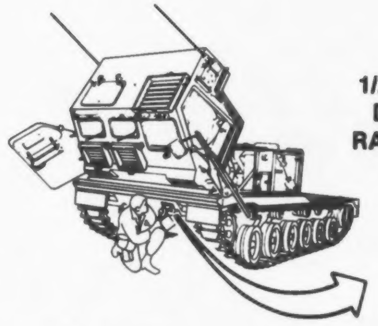
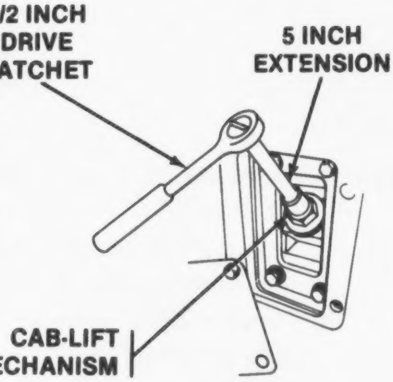
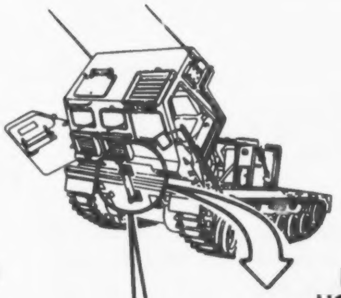



1/2 INCH DRIVE RATCHET
5 INCH EXTENSION
CAB-LIFT MECHANISM

13. INSTALL 1/2 INCH DRIVE RATCHET AND 5 INCH EXTENSION IN CAB LIFT MECHANISM.

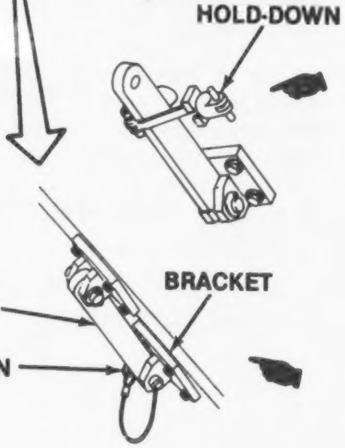


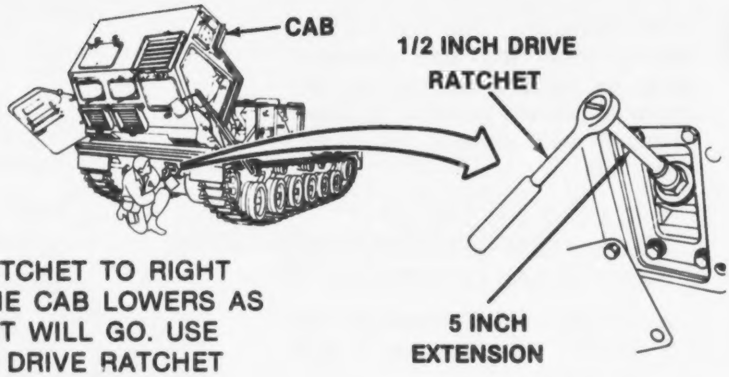
13.1. REMOVE SAFETY STRUT FROM BRACKET.

a. Remove quick release pin from safety strut in bracket.

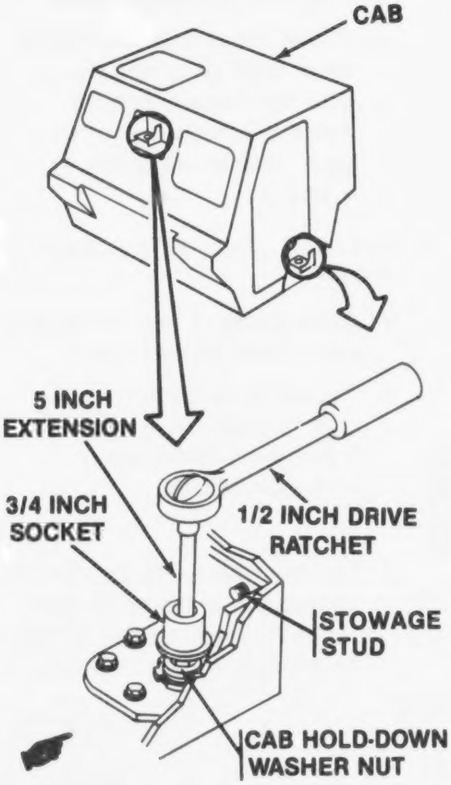
b. Raise safety strut to up position and secure with rubber hold-down.

c. Install quick release pin in bracket.


RUBBER HOLD-DOWN
BRACKET
SAFETY STRUT
QUICK RELEASE PIN


CAB
1/2 INCH DRIVE RATCHET
5 INCH EXTENSION

14. TURN RATCHET TO RIGHT UNTIL THE CAB LOWERS AS FAR AS IT WILL GO. USE 1/2 INCH DRIVE RATCHET AND 5 INCH EXTENSION.


CAB
5 INCH EXTENSION
3/4 INCH SOCKET
1/2 INCH DRIVE RATCHET
STOWAGE STUD
CAB HOLD-DOWN WASHER NUT

CAUTION

Cab hold-down washer nuts must be tightened with ratchet to prevent damage to cab hold-down mechanism.

15. INSTALL CAB HOLD-DOWN WASHER NUTS.
    a. Remove two cab hold-down washer nuts from stowage studs.
    b. Install two cab hold-down washer nuts finger tight.
    c. Tighten two cab hold-down washer nuts 3/4 turn past finger tight. Use 1/2 inch drive ratchet, 5 inch extension, and 3/4 inch socket.

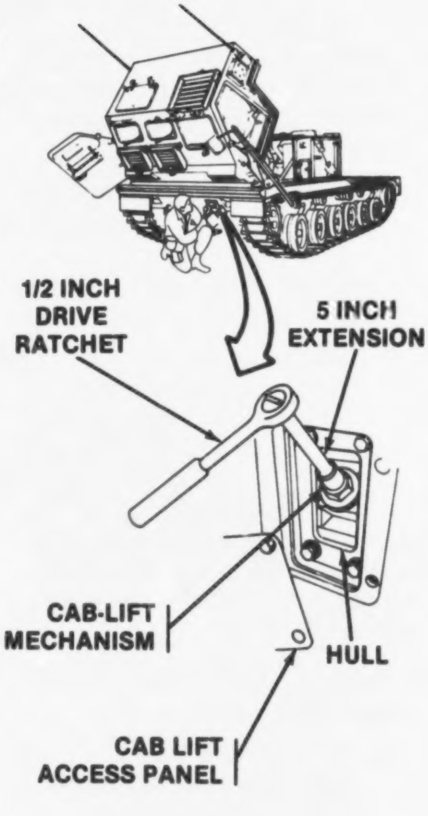
GO TO NEXT PAGE

CAUTION

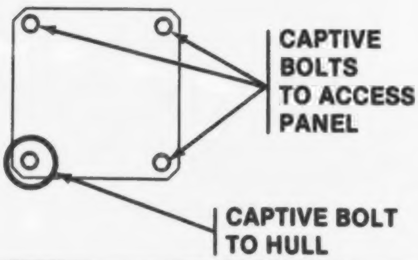
After installing cab hold-down washer nuts, the load (tension) must be relieved on the cab lift screw to prevent possible damage to cab lift mechanism during carrier operation.

16. BACK OFF ON CAB LIFT MECHANISM TO RELIEVE TENSION ON CAB LIFT SCREW.
    a. Install 1/2 inch drive ratchet and 5 inch extension in cab lift mechanism.
    b. Back off on cab lift mechanism. Remove 1/2 inch drive ratchet and 5 inch extension from cab lift mechanism.
    c. Try to move cab lift mechanism with your fingers. If you can't move cab lift mechanism with your fingers, repeat substeps a and b.

17. INSTALL CAB LIFT ACCESS PANEL.
    a. Aline holes in cab lift access panel with holes in hull.
    b. Install three bolts in hull. Use 1/2 inch drive ratchet, 5 inch extension, and 9/16 inch socket.


1/2 INCH DRIVE RATCHET
5 INCH EXTENSION
CAB-LIFT MECHANISM
HULL
CAB LIFT ACCESS PANEL

    c. Tighten four bolts captive to access panel and hull. Use 1/2 inch drive ratchet, 5 inch extension, 9/16 inch socket.


CAPTIVE BOLTS TO ACCESS PANEL
CAPTIVE BOLT TO HULL

END OF TASK

Section IV. OPERATION UNDER UNUSUAL CONDITIONS

TASK INDEX

Task .... Page

Operate NBC System 2-202

Ford Water Less Than 40 Inches (1M) Deep 2-210

Operate Carrier Over Rough Terrain 2-217

Tow Disabled Carrier 2-222

Tow Start Disabled Carrier 2-237

Immediate Action to Stop Runaway Engine 2-243

Fight Cab Compartment Fire 2-246

Fight Engine Compartment Fire 2-248

Warm-Up Procedure for Extended Engine Idling 2-250

OPERATE NBC SYSTEM

DESCRIPTION

This task covers: Activate NBC System (page 2-202). Deactivate NBC System (page 2-207).

INITIAL SETUP

Materials/Parts:

CVC Helmet (App C)
M25A1 Protective Mask (App C)

Personnel Required:

Driver (D)
Commander (C)

Personnel Required (cont):

Gunner (G)

Equipment Conditions:

Hand brake set (page 2-167)
Intercom system operating (page 2-121)

ACTIVATE NBC SYSTEM

WARNING

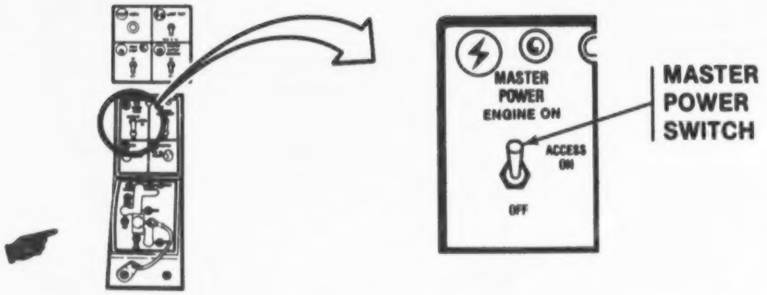
Engine exhaust fumes can poison you. Do not use your NBC masks for protection against engine exhaust fumes. NBC precleaner filter will not protect you against exhaust poisoning.

CAUTION

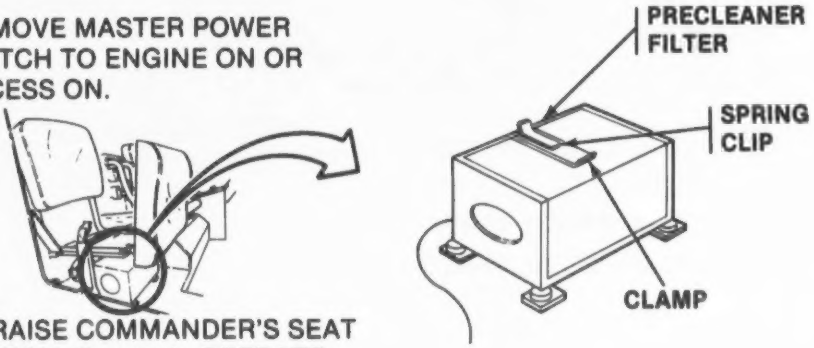
NBC precleaner filter unit can get damaged. Do not flush or splash water around or over precleaner filter unit when you clean cab.

NOTE

NBC system will not operate until spring clip is moved off holes on precleaner filter.


MASTER
POWER
ENGINE ON
ACCESS
ON
OFF
MASTER POWER SWITCH

1. (D) MOVE MASTER POWER SWITCH TO ENGINE ON OR ACCESS ON.

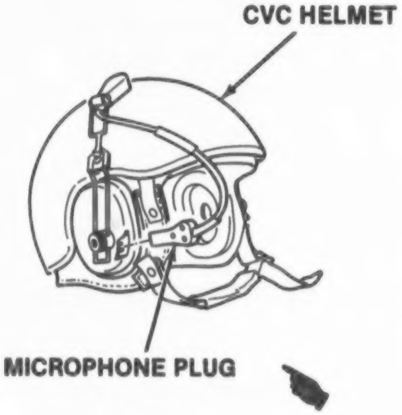

PRECLEANER FILTER
SPRING CLIP
CLAMP

2. (C) RAISE COMMANDER'S SEAT BOTTOM. See task: OPERATE SEATS, page 2-112.

3. (C) SLIDE SPRING CLIP TO ONE SIDE OF HOLES ON PRECLEANER FILTER.
   a. Spread clamp and slide spring clip to one side of precleaner filter.

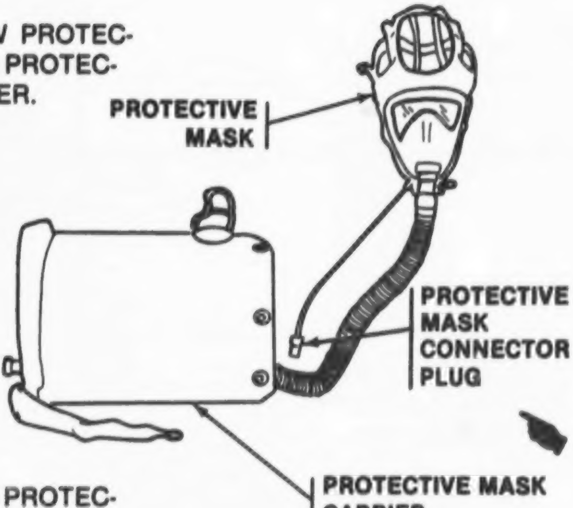
4. (C) LOWER COMMANDER'S SEAT BOTTOM. See task: OPERATE SEATS, page 2-112.

5. (D) (C) (G) REMOVE CVC HELMET.
   a. Remove CVC helmet.
   b. Remove microphone plug from CVC helmet.

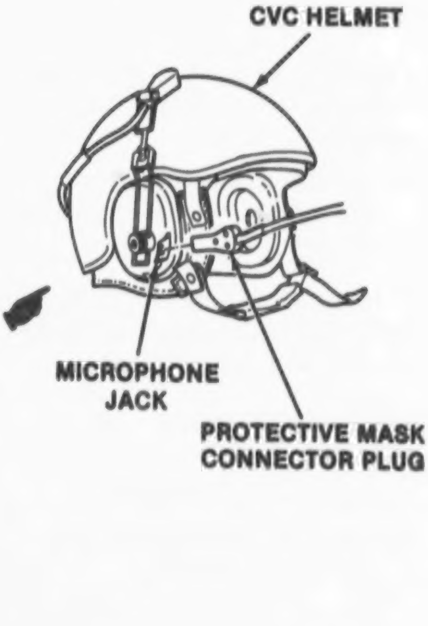

CVC HELMET
MICROPHONE PLUG

GO TO NEXT PAGE

6. (D) (C) (G) UNSTOW PROTECTIVE MASK FROM PROTECTIVE MASK CARRIER.


PROTECTIVE MASK
PROTECTIVE MASK CONNECTOR PLUG
PROTECTIVE MASK CARRIER

7. (D) (C) (G) PUT ON PROTECTIVE MASK.
   - a. Put on protective mask.
   - b. Adjust protective mask.

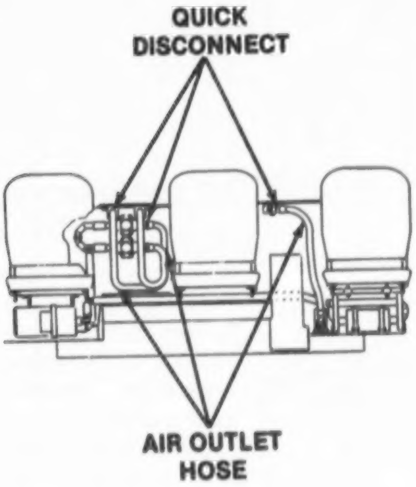

CVC HELMET
MICROPHONE JACK
PROTECTIVE MASK CONNECTOR PLUG

8. (D) (C) (G) INSERT PROTECTIVE MASK CONNECTOR PLUG INTO CVC HELMET AT MICROPHONE JACK.

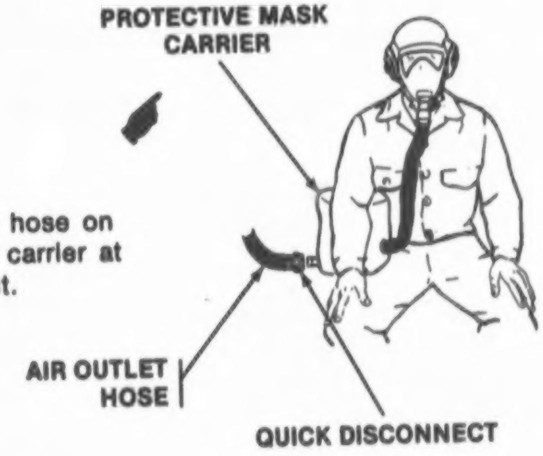
9. (D) (C) (G) PUT ON CVC HELMET.

10. (D) (C) (G) INSTALL AIR OUTLET HOSE ON PROTECTIVE MASK CARRIER.

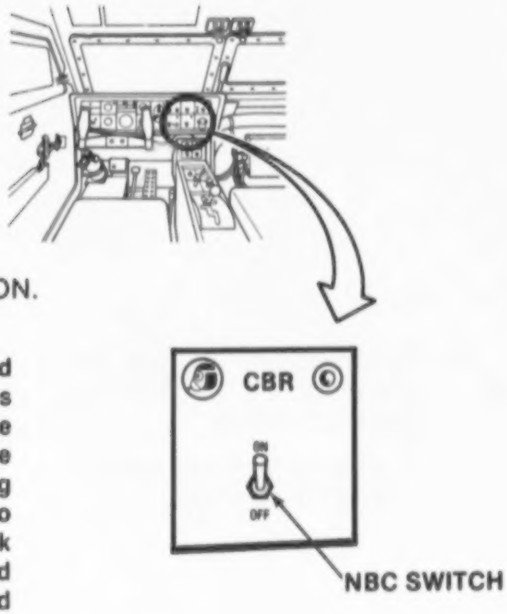
a. Remove air outlet hose at quick disconnect.


QUICK DISCONNECT
AIR OUTLET HOSE

b. Install air outlet hose on protective mask carrier at quick disconnect.


PROTECTIVE MASK CARRIER
AIR OUTLET HOSE
QUICK DISCONNECT

GO TO NEXT PAGE



11. (D) MOVE NBC SWITCH TO ON.

WARNING

During cold weather there is danger of frostbite to the cheekbone area when inhaling subfreezing air. Do not connect air outlet hose to tank masks until air is heated. Hold your hand over air outlet hose and feel if air is warm.

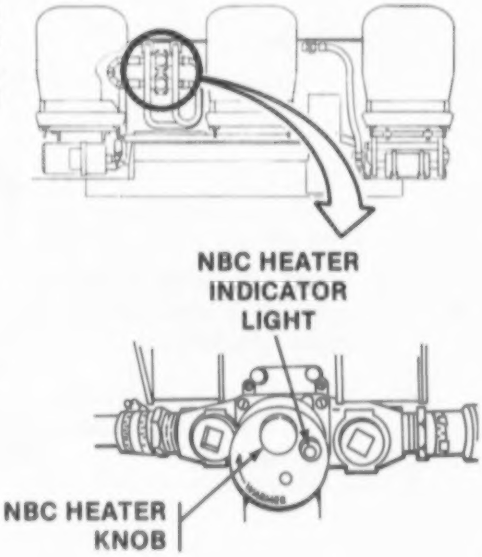
NOTE

If air coming from air outlet hoses is too cold to be breathed safely, do steps 12 thru 14. If air coming from air outlet hoses can be breathed safely, go to step 14.

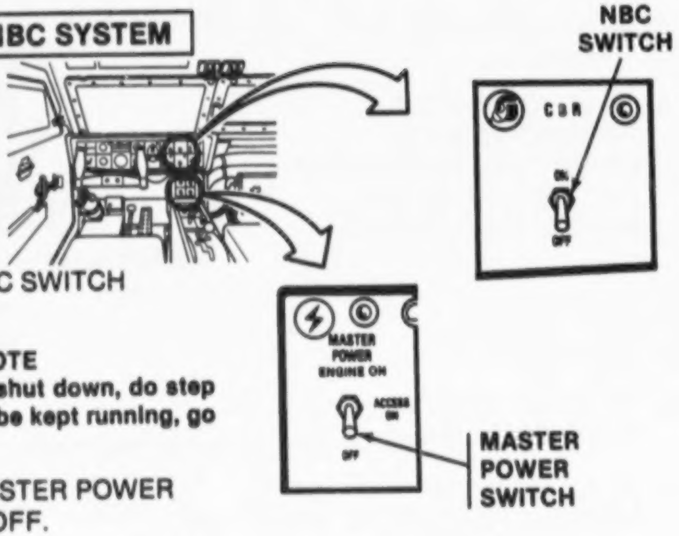
12. (D) (C) G) TURN ON NBC SYSTEM HEATER.
    a. Turn NBC heater knob to right until NBC heater indicator light comes on.

13. (D) (C) (G) TURN NBC HEATER KNOB TO RIGHT TO INCREASE AIR TEMPERATURE.

14. (D) (C) (G) TURN OFF NBC HEATER SYSTEM.
    a. Turn NBC heater knob to left to OFF position.



DEACTIVATE NBC SYSTEM

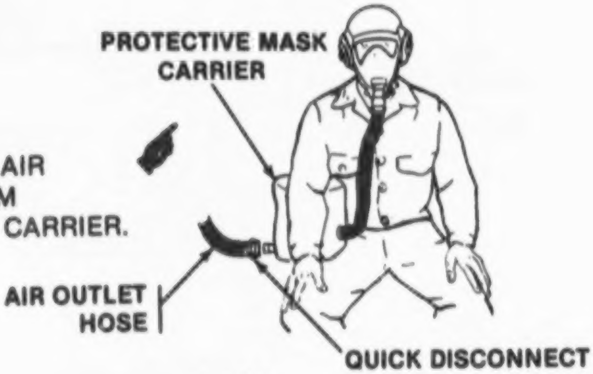

NBC SWITCH
CDR
ON
OFF
MASTER POWER ENGINE ON
ACCESS ON
OFF
MASTER POWER SWITCH

15. (D) MOVE NBC SWITCH TO OFF.

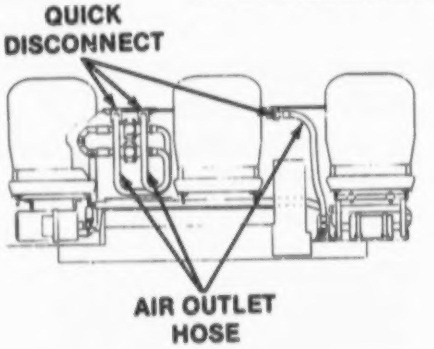
NOTE

If engine is to be shut down, do step 16. If engine is to be kept running, go to step 17.

16. (D) MOVE MASTER POWER SWITCH TO OFF.


PROTECTIVE MASK CARRIER
AIR OUTLET HOSE
QUICK DISCONNECT

17. (D) (C) (G) REMOVE AIR OUTLET HOSE FROM PROTECTIVE MASK CARRIER.


QUICK DISCONNECT
AIR OUTLET HOSE

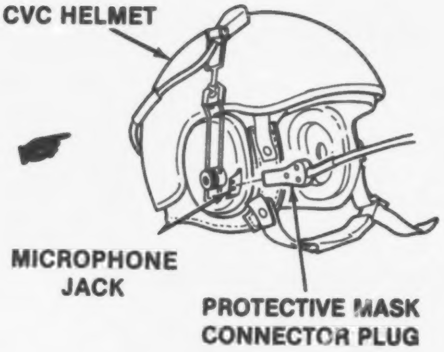
a. Remove air outlet hose from protective mask carrier at quick disconnect.

b. Install air outlet hose at quick disconnect.

GO TO NEXT PAGE

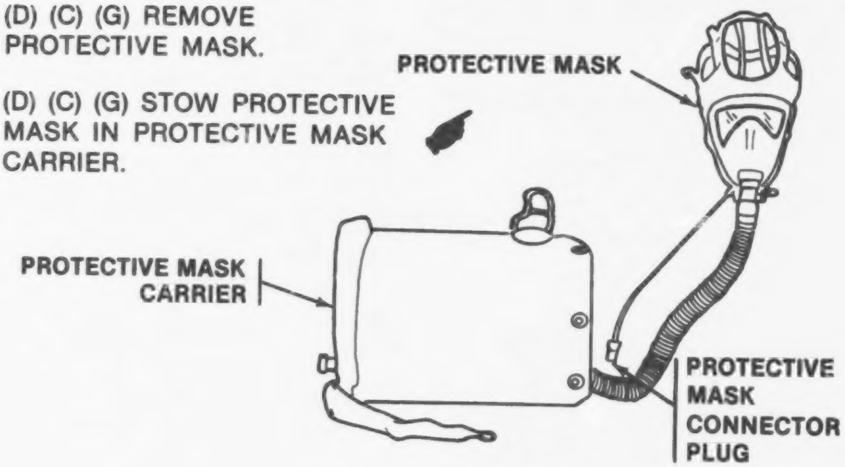
18. (D) (C) (G) REMOVE CVC HELMET.

19. (D) (C) (G) REMOVE PROTECTIVE MASK CONNECTOR PLUG FROM CVC HELMET AT MICROPHONE JACK.

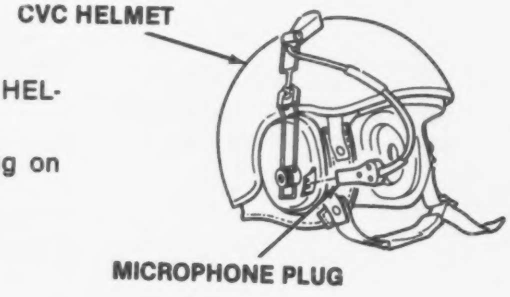

CVC HELMET
MICROPHONE JACK
PROTECTIVE MASK CONNECTOR PLUG

20. (D) (C) (G) REMOVE PROTECTIVE MASK.

21. (D) (C) (G) STOW PROTECTIVE MASK IN PROTECTIVE MASK CARRIER.


PROTECTIVE MASK
PROTECTIVE MASK CARRIER
PROTECTIVE MASK CONNECTOR PLUG

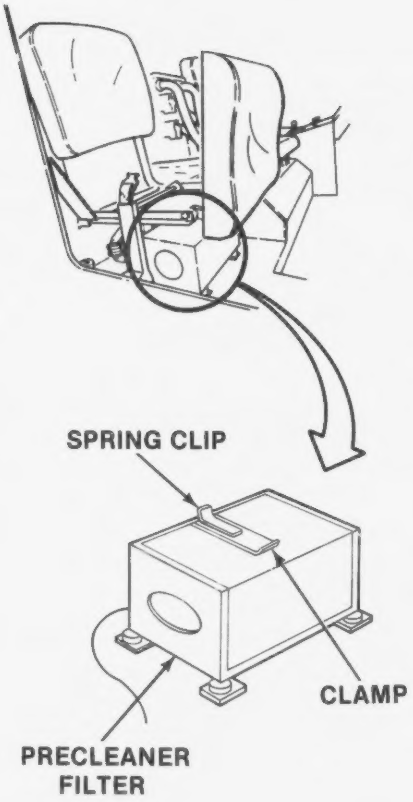
22. (D) (C) (G) PUT ON CVC HELMET.
    a. Install microphone plug on CVC helmet.
    b. Put on CVC helmet.


CVC HELMET
MICROPHONE PLUG

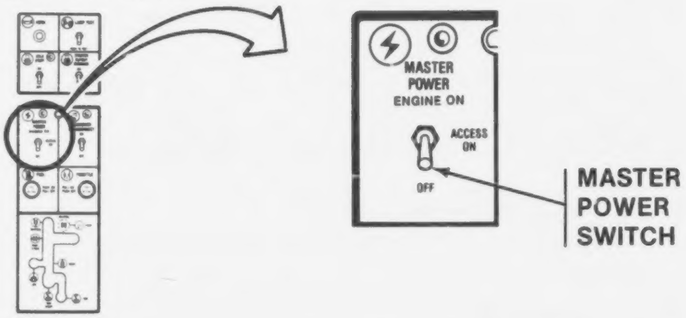
23. (C) RAISE COMMANDER'S SEAT BOTTOM. See task: OPERATE SEATS, page 2-112.

24. (C) SLIDE SPRING CLIP OVER HOLES ON PRECLEANER FILTER.
    a. Spread clamp and slide spring clip over holes on precleaner filter.

25. (C) LOWER COMMANDER'S SEAT BOTTOM. See task: OPERATE SEATS, page 2-112.


SPRING CLIP
CLAMP
PRECLEANER FILTER

26. (D) MOVE MASTER POWER SWITCH TO ENGINE OFF.


MASTER POWER ENGINE ON
ACCESS ON
OFF
MASTER POWER SWITCH

END OF TASK

FORD WATER LESS THAN 40 INCHES (1 M) DEEP

DESCRIPTION

This task covers: Prepare to Ford Water (page 2-210). Ford Water (page 2-212). Perform Post Fording Operations (page 2-214).

INITIAL SETUP

Tools:

Ratchet wrench, 3/4 inch drive (Item 23, App B)
Ratchet wrench, 1/2 inch drive (Item 24, App B)
Socket, 9/16 inch, 1/2 inch drive (item 41, App B)

Personnel Required:

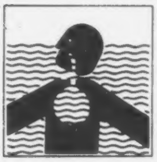
Driver
Crew

Equipment Conditions:

Engine stopped (page 2-167)

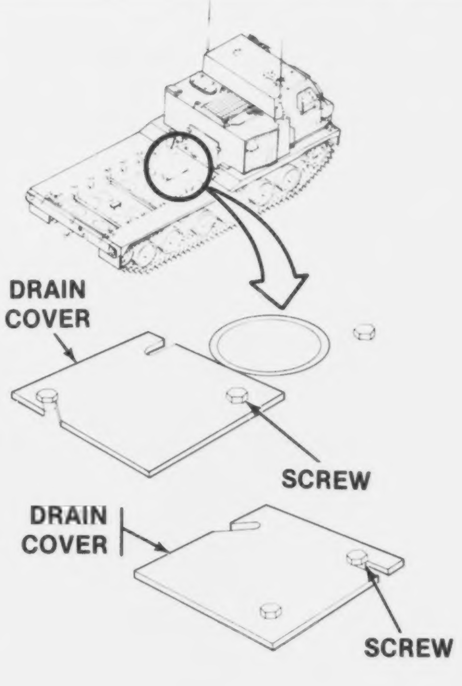
PREPARE TO FORD WATER

WARNING

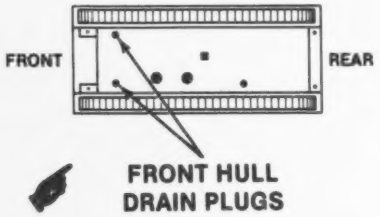


Carrier will sink in deep water. Soldiers can drown or be injured. Do not drive carrier in water more than 40 inches (1 m) deep.

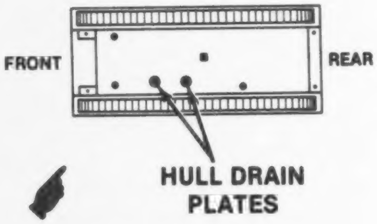
1. CLOSE DRAIN COVER.
   a. Loosen three screws. Use 1/2 inch drive ratchet wrench and 9/16 inch socket.
   b. Rotate and close drain cover.
   c. Tighten three screws. Use 1/2 inch drive ratchet wrench and 9/16 inch socket.



2. CHECK THAT FRONT HULL DRAIN PLUGS ARE IN PLACE AND SECURED.

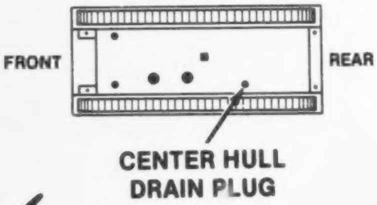

FRONT
REAR
FRONT HULL DRAIN PLUGS

3. CHECK THAT TWO HULL DRAIN PLATES ARE IN PLACE AND SECURED.
   - a. Check that four screws on each of two hull drain plates are in place and secured. Use 1/2 inch drive ratchet wrench and 9/16 inch socket.


FRONT
REAR
HULL DRAIN PLATES

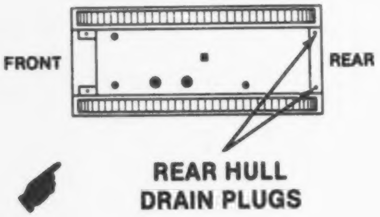
NOTE

Center and rear hull drain plugs are used only during fording. When not in use, they are stowed in tool bag.


FRONT
REAR
CENTER HULL DRAIN PLUG

4. INSTALL CENTER HULL DRAIN PLUG UNDER REAR OF CARRIER. USE 3/4 INCH DRIVE RATCHET WRENCH.

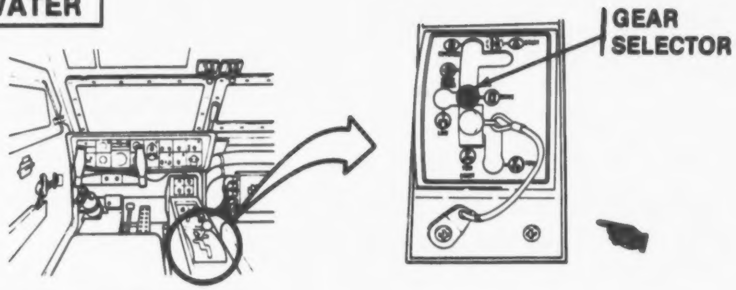
5. INSTALL TWO REAR HULL DRAIN PLUGS. USE 3/4 INCH DRIVE RATCHET WRENCH.


FRONT
REAR
REAR HULL DRAIN PLUGS

6. START ENGINE. See page 2-123.

GO TO NEXT PAGE

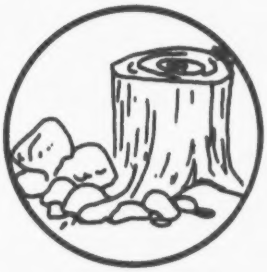
FORD WATER

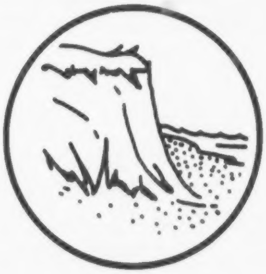


7. MOVE GEAR SELECTOR TO DRIVE.

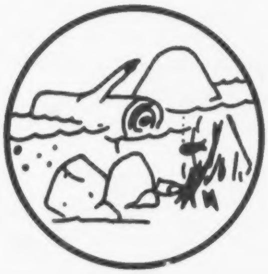
8. CHOOSE SPOT TO ENTER AND EXIT WATER.

   a. Look for firm ground without rocks, stumps, or other obstacles.



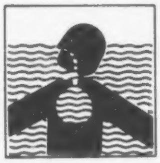


   b. Avoid steep slopes and soft ground.

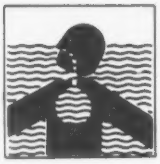


   c. Watch out for obstacles under water.

WARNING



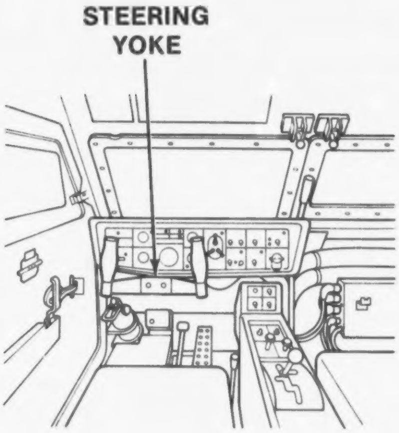
Carrier will sink in deep water. Soldiers can drown or be injured. Do not drive carrier in water more than 40 inches (1 m) deep.

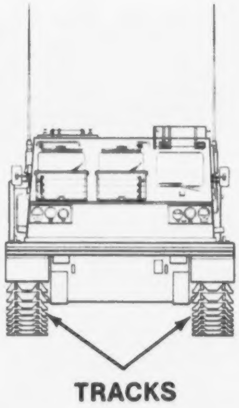


Carrier can be flooded. Soldiers can drown or be injured. Do not go into water with choppy waves. Do not try a direct crossing in swift current.

CAUTION

Carrier can be swamped or stranded if underwater obstructions do not support both tracks. Be prepared to stop carrier quickly.



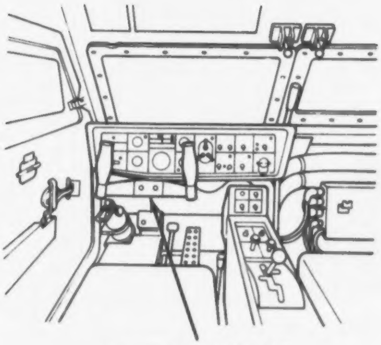


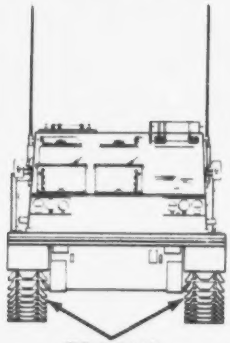
9. ENTER WATER.
   a. Center steering yoke.
   b. Both tracks should be on solid ground.

GO TO NEXT PAGE

10. FORD WATER.

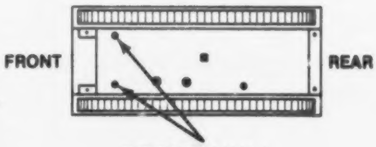
11. EXIT WATER.
    a. Center steering yoke.
    b. Both tracks should be on solid ground.


STEERING YOKE

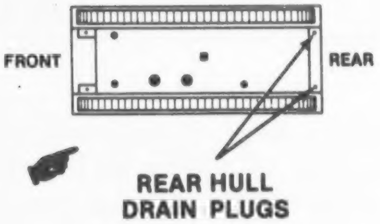


PERFORM POST FORDING OPERATIONS

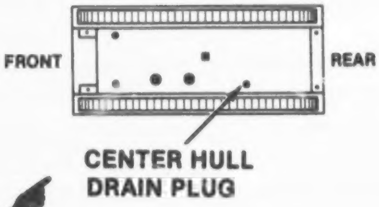
12. REMOVE TWO FRONT HULL DRAIN PLUGS. USE 3/4 INCH DRIVE RATCHET WRENCH.


FRONT
REAR
FRONT HULL DRAIN PLUGS

13. REMOVE TWO REAR HULL DRAIN PLUGS. STOW IN TOOL BAG. USE 3/4 INCH DRIVE RATCHET WRENCH.


FRONT
REAR
REAR HULL DRAIN PLUGS

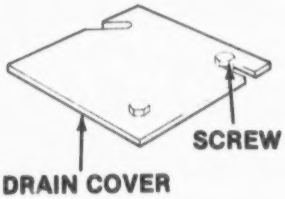
14. REMOVE CENTER HULL DRAIN PLUG UNDER REAR OF CARRIER. STOW IN TOOL BAG. USE 3/4 INCH DRIVE RATCHET WRENCH.

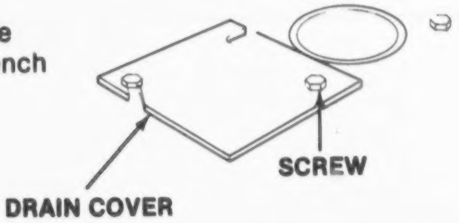

FRONT
REAR
CENTER HULL DRAIN PLUG

15. OPEN DRAIN COVER.

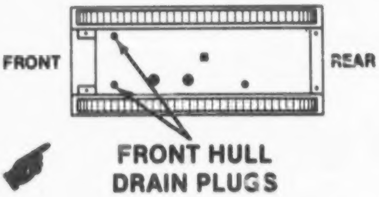
   a. Loosen three screws. Use 1/2 inch drive ratchet wrench and 9/16 inch socket.

   b. Tighten three screws. Use 1/2 inch drive ratchet wrench and 9/16 inch socket.


SCREW
DRAIN COVER


SCREW
DRAIN COVER

16. AFTER HULL IS DRAINED, INSTALL FRONT HULL DRAIN PLUGS.


FRONT
REAR
FRONT HULL DRAIN PLUGS

GO TO NEXT PAGE

DO'S AND DON'TS

DO

Control carrier in water the same way as on land. Allow for a slower response time in water.

Use accelerator pedal to accelerate engine when carrier is about halfway in water.

Release steering yoke before completing turns to avoid overshooting turns.

Always enter the water slowly at a right angle to shore.

As you drive toward an exit point upstream, point carrier above exit point to make allowance for a fast current.

Exit water as soon as possible.

Maneuver carrier so both tracks get a good bite on ground. Give carrier enough throttle to climb out of water.

DON'T

Expose side of carrier to upstream current when current is swift. Carrier can take on water.

END OF TASK

OPERATE CARRIER OVER ROUGH TERRAIN

INITIAL SETUP

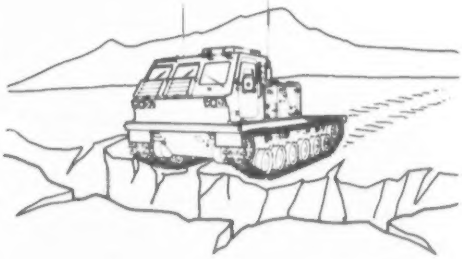
Personnel Required:	Equipment Conditions:
Driver Crew	Engine started (page 2-167)

WARNING

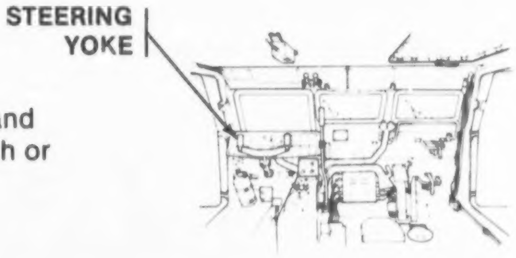
Carrier can roll over and kill or injure soldiers. Avoid high speeds and sudden turns when driving on hills or rough terrain. Wear seat belts.

CAUTION

Carrier will get stuck in trenches wider than 7.5 feet (2.3 m) or vertical wall 30 inches (76 cm) high. Do not cross trenches wider than 7.5 feet (2.3 m), or climb walls higher than 30 inches (76 cm).



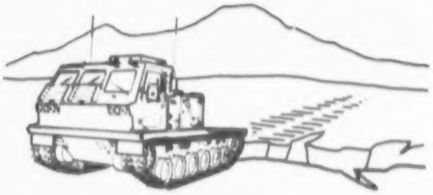
1. DRIVE CARRIER OVER TRENCHES AND OBSTACLES.
   a. Drive up to trench and obstacles straight on.



   b. Center steering yoke and drive slowly over trench or obstacle.

GO TO NEXT PAGE

c. Accelerate when carrier clears trench or obstacle.



WARNING

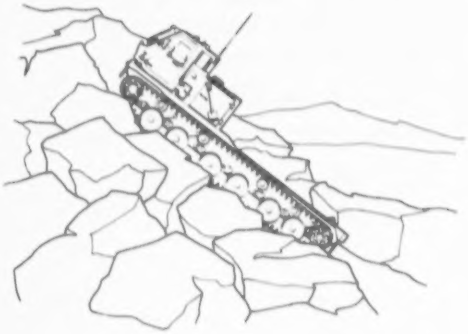
Carrier can roll over and kill or injure soldiers if it turns sideways on a steep slope. Keep carrier going straight up steep slope. Use extreme caution when driving on steep slopes.

CAUTION

Carrier can overheat while climbing hills. If carrier surges between low and high gear while climbing hills, move to low gear.

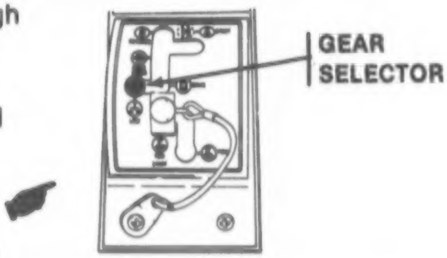
2. DRIVE CARRIER ON HILLS.

   a. Accelerate enough to keep carrier from stalling on steep hills.

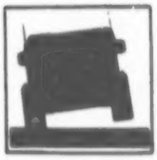


b. If carrier surges between high and low gear, move gear selector to LOW.

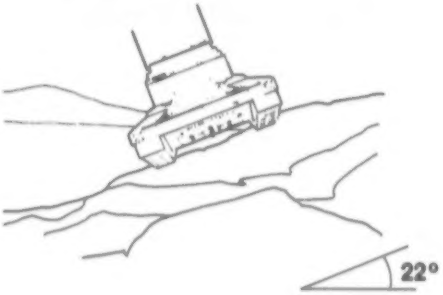
c. Slow down at top of hill, and keep carrier under control going downhill.



WARNING



Carrier can roll over and kill or injure soldiers. Do not drive on side slopes steeper than 40 percent slope (22 degrees).

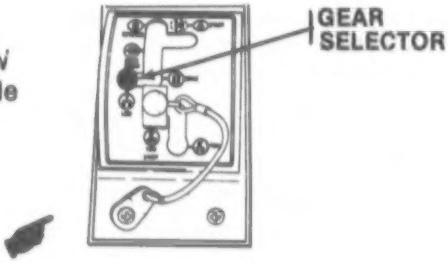


CAUTION

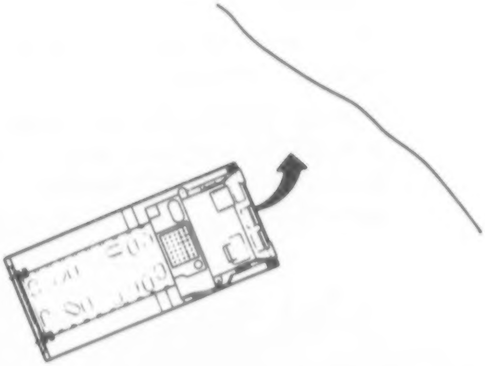
Sharp turns on snow, ice, or mud can cause carrier to throw a track. Make a series of small, wide turns instead of one sharp turn.

3. DRIVE CARRIER ON SIDE SLOPES.

a. Move gear selector to LOW before driving on steep side slope.

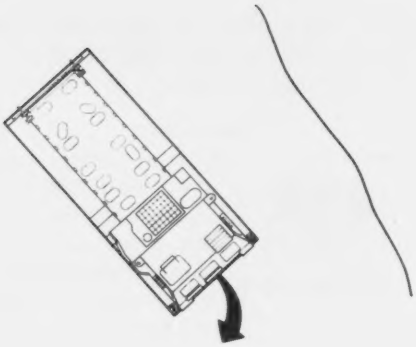


b. Slowly turn carrier uphill if rear of carrier is sliding downhill.



GO TO NEXT PAGE

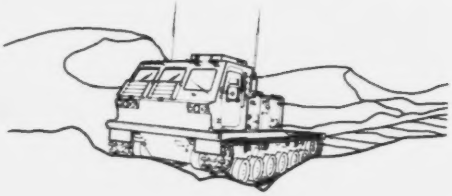
c. Slowly turn carrier downhill if front of carrier is sliding downhill.



CAUTION

Sharp turns on snow, ice, or mud can cause carrier to throw a track. Make a series of small, wide turns instead of one sharp turn.

4. DRIVE CARRIER ON SNOW, ICE, OR MUD.
   a. Control carrier speed, and drive as smoothly as possible.
   b. Slow carrier smoothly before making a turn on ice.
   c. If carrier breaks through crust of deep snow or soft soil, steer carrier straight to get back on crust.



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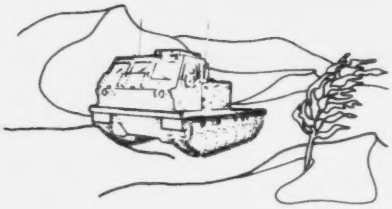
5. PARK CARRIER ON SNOW, ICE, OR MUD.
   a. If possible, stop carrier on firm surface.
   b. When mission is completed park carrier in a sheltered area with left side of carrier faced away from wind.
   c. Clear snow, ice, and mud off road wheels and track after parking.
   d. If carrier is parked in low area where water may freeze under tracks, put brush or branches under tracks.



END OF TASK

TOW DISABLED CARRIER

DESCRIPTION

This task covers: Connect Towing Carrier/Vehicle and Disabled Carrier With Tow Bar (page 2-222). Connect Disabled Carrier and Towing Carrier/Vehicle With Tow Cables (page 2-226). Prepare To Tow Disabled Carrier (page (2-228). Tow Disabled Carrier (page 2-230). Disconnect Towing Carrier/Vehicle and Disabled Carrier When Using Tow Bar (page 2-233). Disconnect Towing Carrier/Vehicle and Disabled Carrier When Using Tow Cables (page 2-234).

INITIAL SETUP

Tools:

- Tow bar
- Crowbar (Item 9, App B)
- Tow cable wire rope assembly (Item 7, App B)

Personnel Required:

- Driver (D) (2)
- Helper (H) (4)

Equipment Conditions:

- Disabled carrier
- Operational carrier or vehicle of equal size or larger

CONNECT TOWING CARRIER/VEHICLE AND DISABLED CARRIER WITH TOW BAR

CAUTION

Towing a carrier with damaged transmission can damage final drives. Towing a carrier with damaged final drive can damage transmission. Have organizational maintenance remove propeller shafts if disabled carrier has damaged transmission or final drives.

NOTE

Disabled carrier will not move if final drives seize. Do not tow carrier if final drives seize. Notify organizational maintenance.

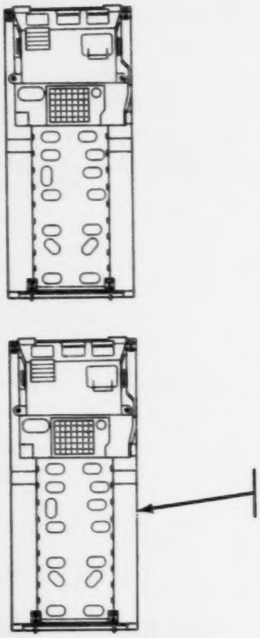
DO'S and DON'TS at end of task must be read before towing carrier.

Task is written for a carrier. When using another vehicle to tow a disabled carrier use proper vehicle operator's manual.

A small vehicle will not tow a larger one. Towing vehicle must be the same size or larger than a disabled carrier.

Disabled carrier may be towed backward if necessary. Tow bar or cables may be attached to rear towing eyes of disabled carrier. Except in an emergency, disabled carrier must not be towed backward faster than 5 mph (8 km/h).

1. ALINE REAR OF TOWING CARRIER WITH FRONT OF DISABLED CARRIER.



WARNING

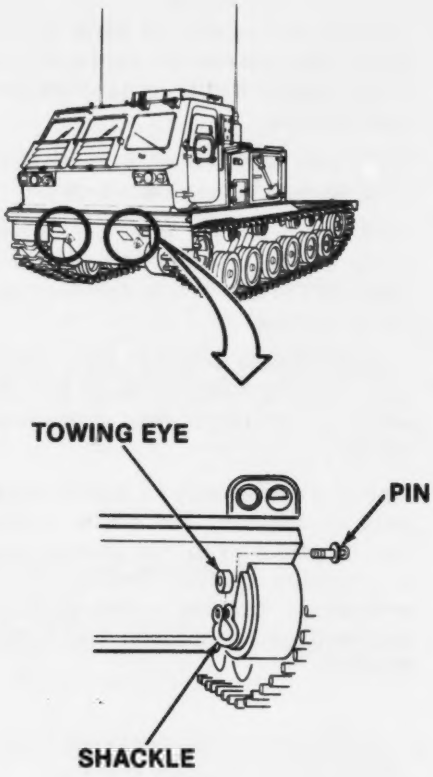
Disabled carrier can crash into towing carrier. Soldiers can be injured. Carriers can get damaged. Be sure to use tow bar when towing downhill, when tow starting carrier, or when tracks or propeller shafts have been removed.

GO TO NEXT PAGE

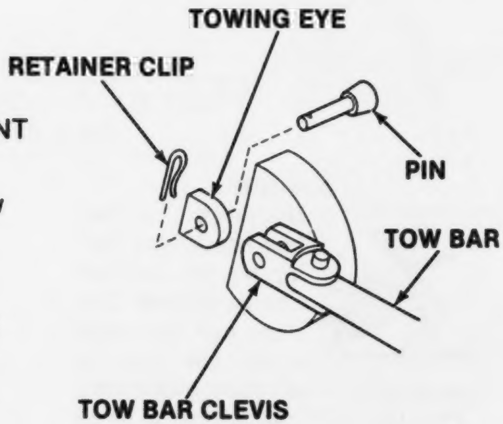
NOTE

Tow bar is obtained from organizational maintenance.

2. REMOVE TWO PINS AND SHACKLES FROM TWO TOWING EYES ON DISABLED CARRIER.
   a. Remove two pins and shackles.
   b. Stow pins and shackles in carrier.


TOWING EYE
PIN
SHACKLE

3. INSTALL TOW BAR ON FRONT OF DISABLED CARRIER.
   a. Remove two pins from tow bar.
   b. (H) Hold up tow bar.
   c. Insert pin through tow bar clevis and towing eye.
   d. Insert retainer clip.
   e. Repeat substeps b thru d above for second towing eye.


TOWING EYE
RETAINER CLIP
PIN
TOW BAR
TOW BAR CLEVIS

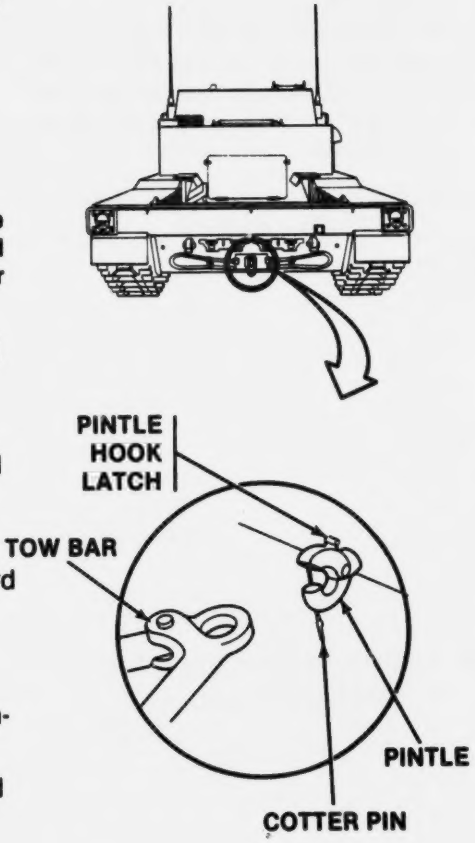
WARNING

Carrier can move suddenly and personnel can get killed or injured if they stand in between tow bar "V" shaped end. Make sure two people stand outside "V" shape and hold tow bar in the middle while attaching tow bar to recovery vehicle.

NOTE

Two helpers, one at front left and one at rear left of carrier, act as ground guides. Two helpers install tow bar on pintle.

4. INSTALL TOW BAR ON PINTLE OF TOWING CARRIER.
   a. Remove cotter pin.
   b. Pull pintle hook latch toward you.
   c. Lift pintle open.
   d. Drive towing carrier backward until pintle reaches tow bar. See task: DRIVE CARRIER, page 2-158.
   e. Lift tow bar and place on pintle. Have helper assist.
   f. Close pintle over tow bar and lock with cotter pin.
   g. Go to step 9.



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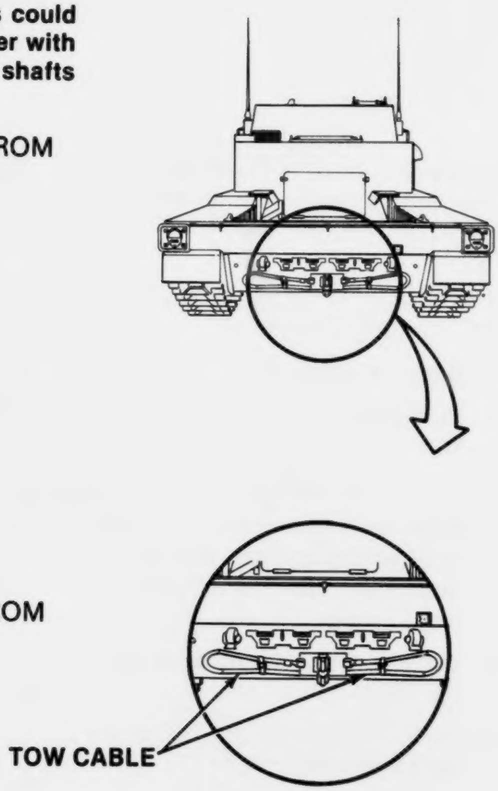
CONNECT DISABLED CARRIER AND TOWING CARRIER/VEHICLE WITH TOW CABLES

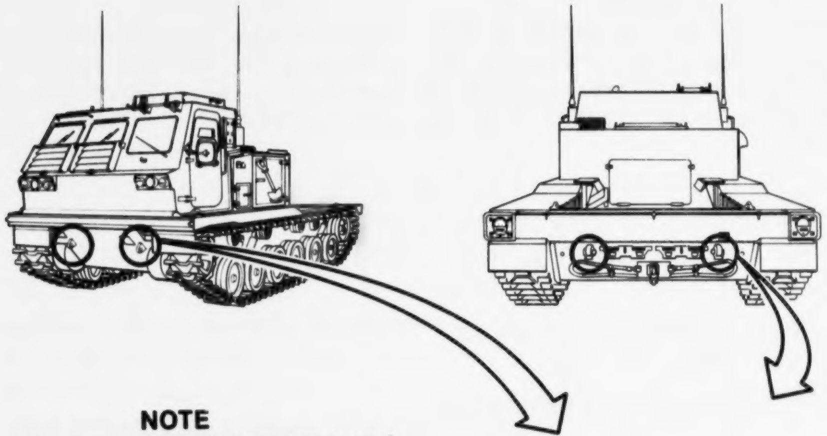
WARNING

Carrier with tracks or propeller shafts removed has no steering or braking control. Disabled carrier can crash into towing carrier. Soldiers could be injured. Do not tow carrier with cables if tracks or propeller shafts are removed. Use tow bar.

5. REMOVE TOW CABLE FROM DISABLED CARRIER.

6. REMOVE TOW CABLE FROM TOWING CARRIER.

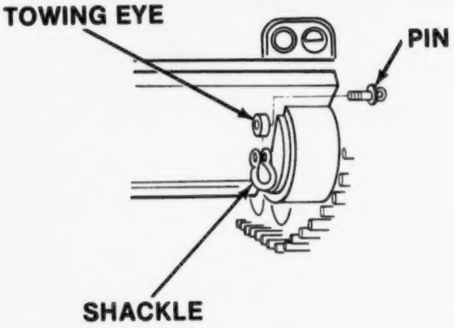




NOTE

Shackles are removed from front and rear in same way.

7. REMOVE FOUR PINS AND SHACKLES FROM REAR OF TOWING CARRIER AND FRONT OF DISABLED CARRIER.
   a. Remove four pins and shackles from four towing eyes.
   b. Place shackle on towing eye.
   c. Install pin through shackle and towing eye.
   d. Repeat substeps a thru c above until cables are connected.



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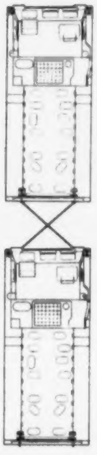
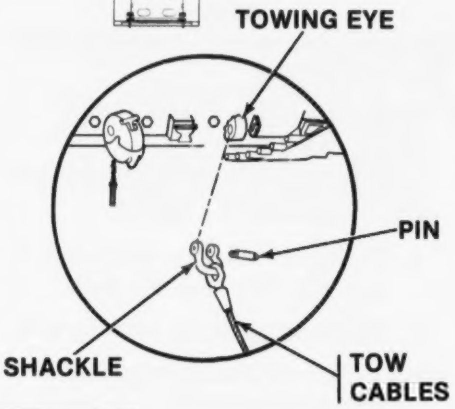
NOTE

Left rear of towing carrier is connected to right front of disabled carrier. Right rear of towing carrier is connected to left front of disabled carrier.

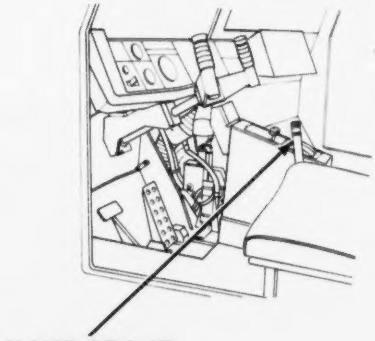
8. INSTALL TWO TOWING CABLES ON FRONT OF DISABLED CARRIER AND REAR OF TOWING CARRIER IN AN "X" PATTERN.
   a. Put shackle through end of tow cable.
   b. Place shackle on towing eye.
   c. Install pin through shackle and towing eye.
   d. Repeat substeps a thru c above until cables are connected.





PREPARE TO TOW DISABLED CARRIER

9. RELEASE DISABLED CARRIER HAND BRAKE.



CAUTION

Failure to put gear selector in TOW position may damage transmission of disabled carrier. Check that gear selector of disabled carrier is in TOW position.

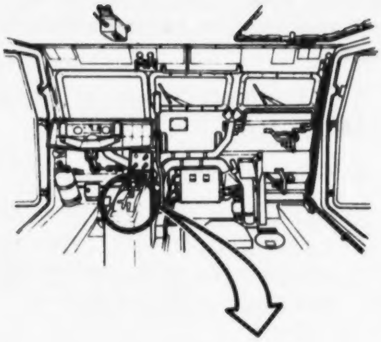
NOTE

With gear selector in TOW, oil circulates through transmission. Carrier still has brakes.

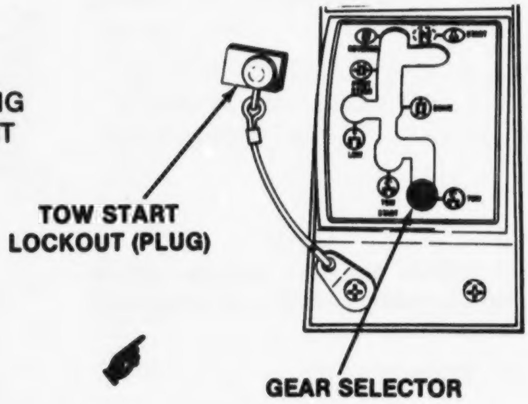
Gear selector can be left in N (neutral) if propeller shafts have been removed.

TOW START lockout (plug) must be removed before shifting gear selector to TOW.

10. MOVE DISABLED CARRIER GEAR SELECTOR TO TOW AND PUSH DOWN TO LOCK.
    a. Remove TOW START lockout (plug) from gear selector panel.
    b. Move gear selector to TOW and push down to lock.



11. START ENGINE IN TOWING CARRIER. See task: START ENGINE, page 2-123.



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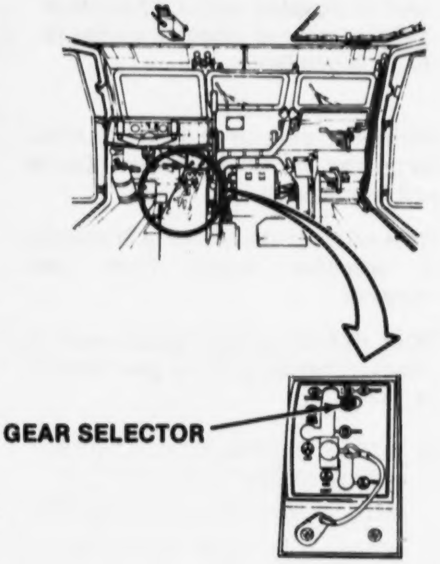
TOW DISABLED CARRIER

WARNING

Braking when you tow with tow cables or tow bar can jackknife carrier. Jackknife could injure soldiers and damage carriers. Do not tow at speeds over 15 mph (25 km/h) with tow bar. Do not tow at speeds over 5 mph (8 km/h) when in rough terrain, towing backward, or towing with tow cables.

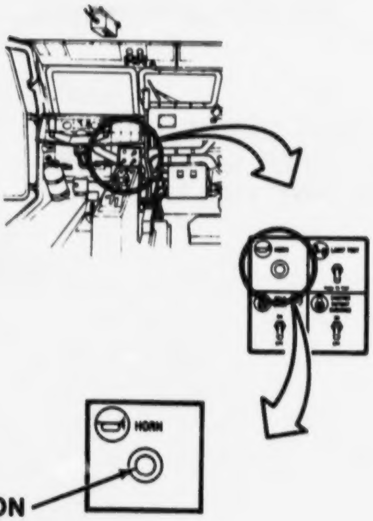


12. SET TOWING CARRIER GEAR SELECTOR.
    a. Step on brake pedal.
    b. Move gear selector from N (neutral) to DRIVE, LOW (for rough terrain), or REVERSE (for towing backward).

NOTE

If tactical situation permits, turn on service drive lights to warn soldiers and other vehicles of towing operation.

13. OPERATE SERVICE DRIVE LIGHTS. See task: OPERATE CARRIER LIGHTS, page 2-184.



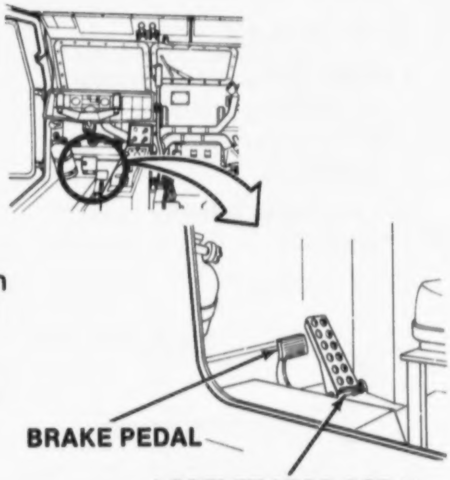
NOTE

If tactical situation permits, sound horn to warn soldiers that carriers are about to move.

14. SOUND HORN.
    a. Press HORN Button.

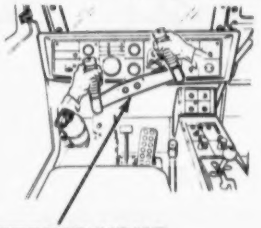
NOTE
Constant speed must be maintained while towing carrier.

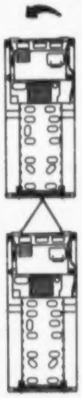
15. MOVE CARRIER WITH CONTROLLED SPEED.
    a. Take foot off brake pedal.
    b. Put foot on accelerator pedal and slowly press down until carrier moves at speed you want (up to 15 mph for tow bar, or 5 mph in rough terrain, when towing backward, and when using tow cables).

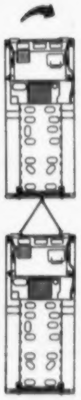


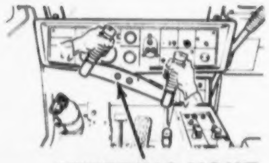
NOTE
Constant speed must be maintained while turning carriers.

16. STEER CARRIER.
    a. Turn steering yoke slowly to left to turn carrier left. Make wide, gradual turn.









    b. Turn steering yoke slowly to right to turn carrier right. Make wide, gradual turn.
    c. Press down on accelerator pedal as carrier turns to maintain speed.

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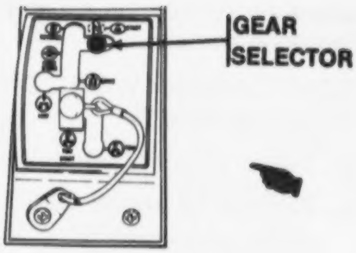
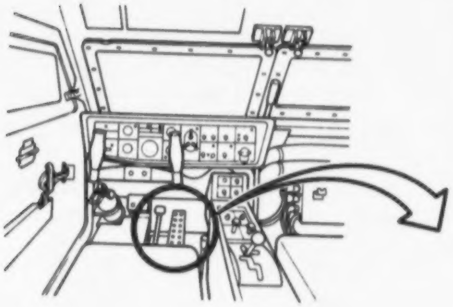
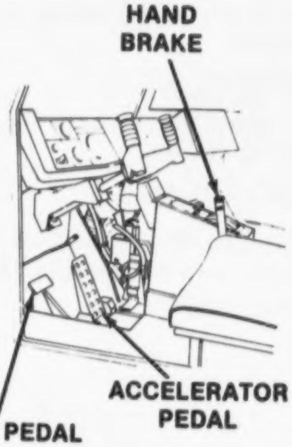
17. STOP CARRIER.
    a. Stop carrier by gradually decreasing pressure on accelerator pedal, without braking.
    b. Move gear selector to N (neutral).


GEAR SELECTOR




HAND BRAKE
ACCELERATOR PEDAL
BRAKE PEDAL

18. SET HAND BRAKE.
    a. Push down and hold brake pedal.
    b. Pull hand brake handle back.
    c. Release foot pressure.
    d. Check to see brake pedal stays down.

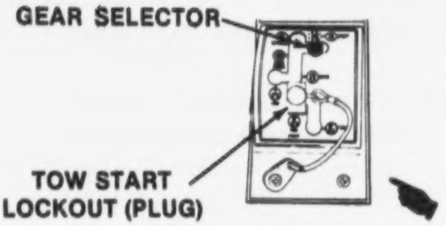
DISCONNECT TOWING CARRIER/VEHICLE AND DISABLED CARRIER WHEN USING TOW BAR

19. STOP ENGINE IN TOWING CARRIER. See task: STOP ENGINE, page 2-167.

19.1. MOVE DISABLED CARRIER GEAR SELECTOR TO N (NEUTRAL) AND INSTALL TOW START LOCKOUT (PLUG).

a. Move gear selector to N (neutral).

b. Install TOW START lockout (plug) in gear selector panel.


GEAR SELECTOR
TOW START LOCKOUT (PLUG)

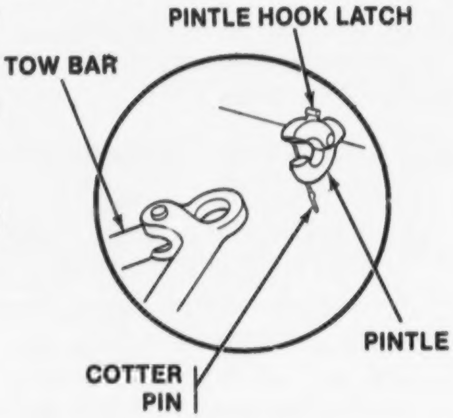
20. DISCONNECT TOW BAR FROM PINTLE OF TOWING CARRIER.

a. Remove cotter pin.

b. Pull pintle hook latch toward you, and lift pintle open.

c. Lift tow bar from pintle and place on ground. Have helper assist.

d. Close pintle and lock with cotter pin.


PINTLE HOOK LATCH
TOW BAR
PINTLE
COTTER PIN

21. DISCONNECT TOW BAR FROM TOWING EYES OF DISABLED CARRIER.

a. Have helper support tow bar.

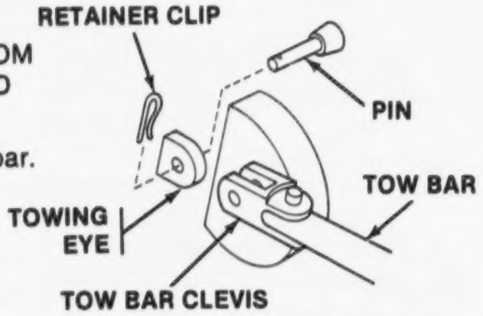
b. Remove retainer clip and remove pin from tow bar clevis.

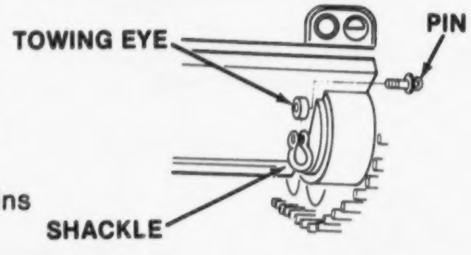
c. Repeat substeps a and b above for second towing eye.

d. Lower tow bar to ground.

e. Install two pins in tow bar clevis and retainer clip.

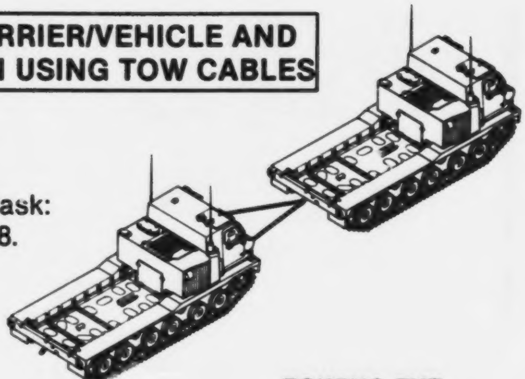
f. Install two shackles and pins on towing eyes.


RETAINER CLIP
PIN
TOW BAR
TOWING EYE
TOW BAR CLEVIS


TOWING EYE
PIN
SHACKLE

GO TO NEXT PAGE

DISCONNECT TOWING CARRIER/VEHICLE AND DISABLED CARRIER WHEN USING TOW CABLES



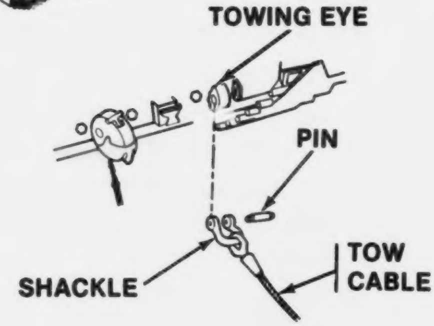
22. DRIVE TOWING CARRIER BACKWARD UNTIL TOW CABLES ARE SLACK. See task: DRIVE CARRIER, page 2-158.

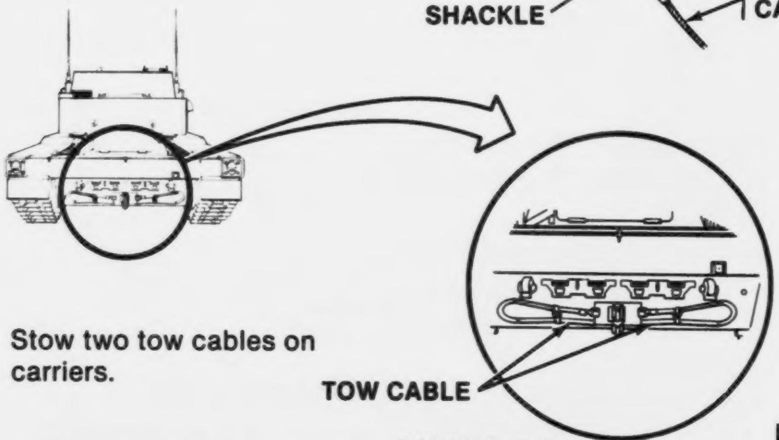
23. STOP ENGINE IN TOWING CARRIER. See task: STOP ENGINE, page 2-167.

24. REMOVE TOW CABLES FROM TOWING EYES.

    a. Remove four pins and shackles from four towing eyes.

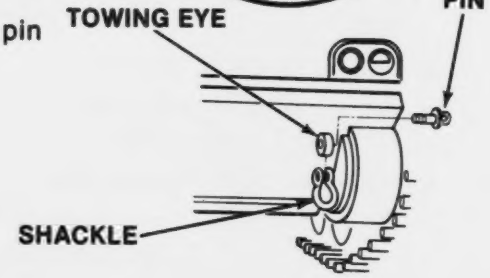
    b. Remove two tow cables from four shackles.


TOWING EYE
PIN
SHACKLE
TOW CABLE



    c. Stow two tow cables on carriers.

    d. Install four shackles and pin on four towing eyes.


TOWING EYE
PIN
SHACKLE

DO'S AND DON'TS

DO

Wear lap safety belts.

Wear approved hearing protectors.

Wear CVC helmet.

Secure all doors and hatches in position.

Keep an eye on your instruments. If you get an unusual reading, stop and check it out.

Observe traffic safety rules.

Be alert for hazards or objects blocking path of carrier.

Use tow bar when both track assemblies are missing or if propeller shafts are removed.

Use tow bar to tow downhill.

Have organizational maintenance remove propeller shafts from disabled carrier when transmission is damaged.

When towing, slow to a stop, gradually decreasing accelerator pressure.

Approach objects blocking path of carrier squarely so both tracks touch object at same time.

Give towing carrier/vehicle enough power so it won't stall on steep hills.

Hold carrier with brakes when on steep hills.

Reduce speed at top of hills. Keep in control going down.

Just as you get to the bottom of steep hills, step on accelerator. This lifts drive assemblies from dirt and suspension does not bottom.

Turn in a series of short turning motions when in loose dirt or dense mud.

Brake before a turn and keep power to tracks during turn.

Use driver in disabled carrier when towing with tow cables.

Connect tow cables in an "X" pattern.

GO TO NEXT PAGE

DO

When towing, gradually decrease pressure on accelerator pedal without braking.

Use vehicle of same or larger size to tow.

Aline towing carrier directly in front of disabled carrier before connecting tow bar or tow cables.

Tow disabled carrier backward only when necessary.

Make slow wide turns.

Accelerate gradually.

Tow carrier downhill very slowly. Brakes could overheat and be damaged.

DON'T

Make sharp turns at high speeds.

Brake while turning.

Slide carrier sideways into loose dirt or against rut.

Make continuous sharp turns in loose dirt or dense mud.

Drive over large objects. You could throw a track.

Cross a trench more than 7.5 feet (2.3 m) wide.

Exceed 15 mph (24 km/h) when towing disabled carrier forward with tow bar.

Exceed 5 mph (8 km/h) when towing disabled carrier backward in rough terrain, or when towing with tow cables.

Climb objects more than 30 inches (76 cm) high.

Break through large objects blocking path of carrier.

Hold carrier on steep slopes or hills with engine and transmission. Transmission could overheat.

Back up towing carrier when disabled carrier is connected to rear except when disconnecting tow cables.

Tow carrier with cables when propeller shafts are disconnected.

Tow carrier if final drive is seized. Notify organizational maintenance.

END OF TASK

TOW START DISABLED CARRIER

INITIAL SETUP

Tools:

Tow bar

Personnel Required:

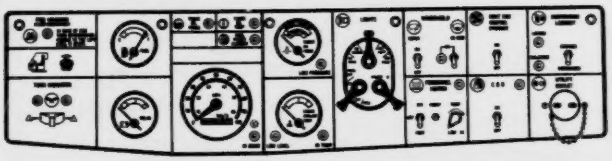
Driver (2)
Helper (H)(4)

Equipment Conditions:

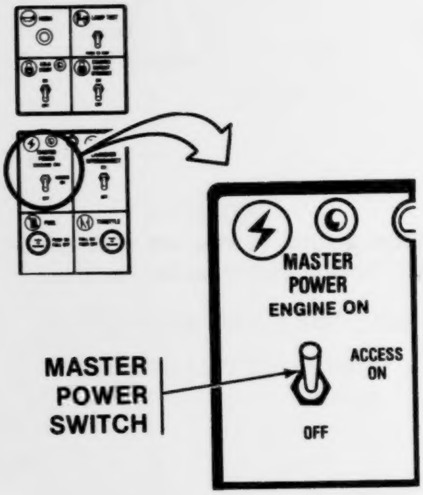
Operational carrier or vehicle of equal size or larger
Disabled carrier

---

1. CONNECT TOWING CARRIER/VEHICLE AND DISABLED CARRIER WITH TOW BAR. See task: TOW DISABLED CARRIER, page 2-230.

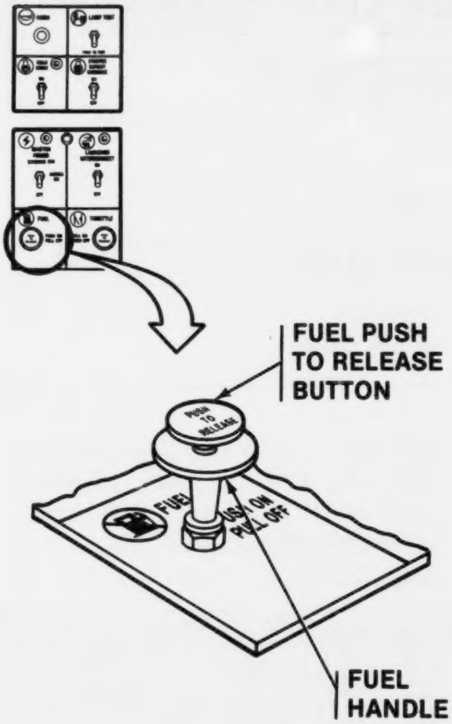


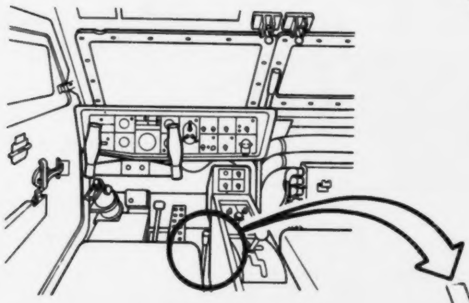
2. MOVE MASTER POWER SWITCH IN DISABLED CARRIER TO ENGINE ON.


MASTER POWER ENGINE ON
ACCESS ON
OFF
MASTER POWER SWITCH

GO TO NEXT PAGE

3. MOVE FUEL HANDLE IN DISABLED CARRIER TO ON.
   a. Press and hold FUEL PUSH TO RELEASE button.
   b. Push FUEL handle to ON.
   c. Release FUEL PUSH TO RELEASE button.

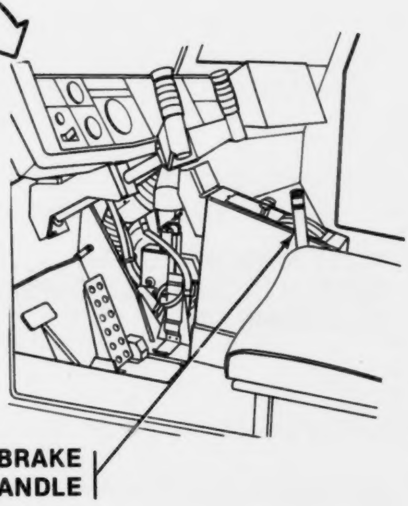

FUEL PUSH TO RELEASE BUTTON
FUEL HANDLE
PUSH TO RELEASE
FUEL
PUSH ON PULL OFF

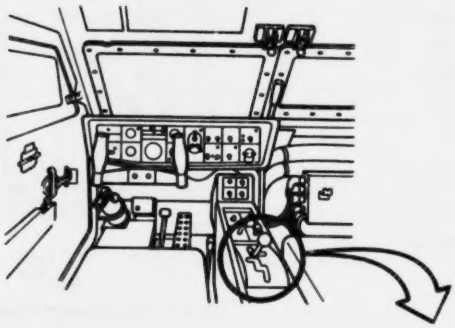


NOTE

Steps 4 thru 12 require a driver in both towing and disabled carriers.

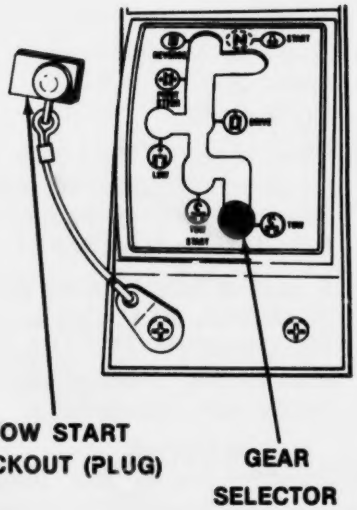
4. RELEASE HAND BRAKE.
   a. Push hand brake handle down.


HAND BRAKE HANDLE



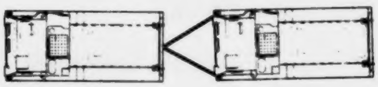
NOTE
TOW START lockout (plug) must be removed before shifting gear selector to TOW.

5. MOVE DISABLED CARRIER GEAR SELECTOR TO TOW AND PUSH DOWN TO LOCK.
   a. Remove TOW START lockout (plug) from gear selector panel.
   b. Move gear selector to TOW and push down to lock.


START
DRIVE
LOW
TOW START
TOW
TOW START LOCKOUT (PLUG)
GEAR SELECTOR

6. START TOWING CARRIER ENGINE. See task: START ENGINE, page 2-123.

7. DRIVE TOWING CARRIER. See task: DRIVE CARRIER, page 2-158.



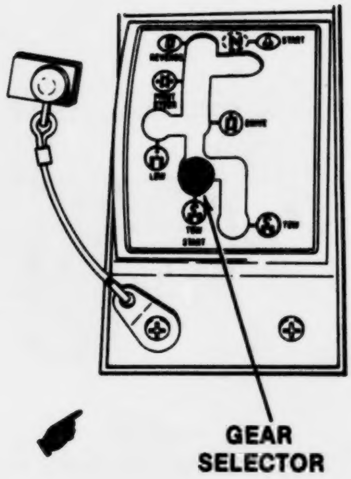
GO TO NEXT PAGE

CAUTION

Removal of TOW START lockout during normal carrier operation can cause transmission damage. Do not remove lockout except when TOW START or TOW position is required.

NOTE

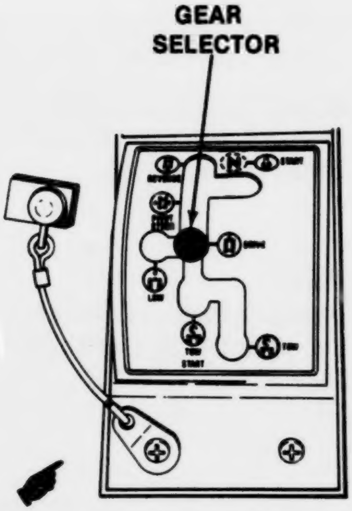
TOW START lockout (plug) must be removed before shifting gear selector from TOW to TOW START.


REVERSE
START
DRIVE
LOW
TOW
TOW START
GEAR SELECTOR

8. TOW START DISABLED CARRIER.
   a. Tow disabled carrier at a speed of 10-15 mph (15-25 km/h).
   b. When speed of 10-15 mph (15-25 km/h) is reached, move disabled carrier gear selector from TOW to TOW START.
   c. If engine fails to start within 30 seconds of towing at 10–15 mph (15–25 km/h), stop towing disabled carrier. Notify unit maintenance.

WARNING

Carrier can jump forward and hit towing vehicle when you shift from TOW START to DRIVE. Soldiers can be injured. Do not accelerate when you shift to DRIVE.

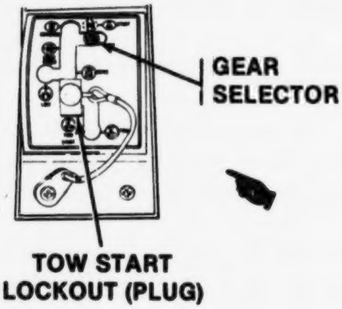

GEAR SELECTOR
START
DRIVE
LOW
TOW
TOW START

9. WHEN DISABLED CARRIER STARTS:
   a. Move disabled carrier gear selector to DRIVE.

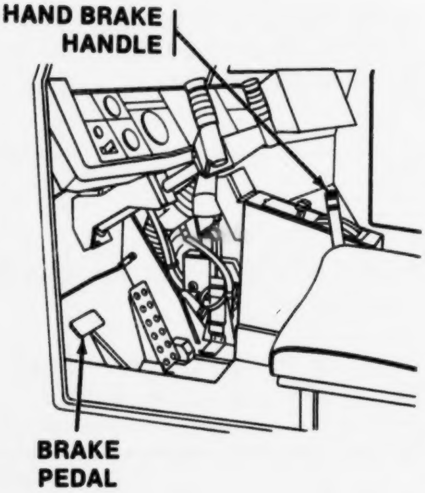
b. Slowly bring both carriers to a stop.

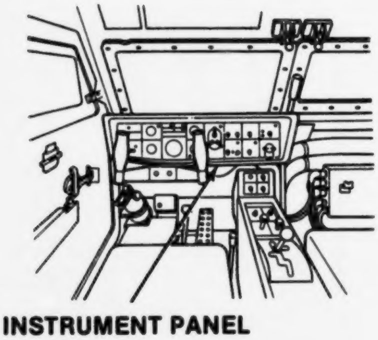
c. Move gear selector in both carriers to N (neutral).

d. Install TOW START lockout (plug) in gear selector panel.


GEAR SELECTOR
TOW START LOCKOUT (PLUG)

10. SET HAND BRAKE ON BOTH CARRIERS.
    a. Push down and hold brake pedal.
    b. Pull hand brake handle back.
    c. Release foot pressure.


HAND BRAKE HANDLE
BRAKE PEDAL


INSTRUMENT PANEL

11. CHECK DISABLED CARRIER INSTRUMENT PANEL FOR NORMAL GAGE READINGS AND LIGHT INDICATIONS.

12. STOP TOWING CARRIER ENGINE. See task: STOP ENGINE, page 2-167.

13. DISCONNECT TOWING CARRIER/VEHICLE AND DISABLED CARRIER WHEN USING TOW BAR. See task: TOW DISABLED CARRIER, page 2-230.

GO TO NEXT PAGE

DO'S AND DON'TS

DO

Slow to a stop by gradually decreasing accelerator pressure.

For towing, use vehicle as large or larger than disabled carrier.

Aline towing vehicle directly in front of disabled carrier before connecting tow bar.

Make slow wide turns.

Accelerate gradually.

Tow carrier downhill very slowly. Brakes could overheat and be damaged.

DON'T

Attempt to tow start carrier with cables.

Exceed 15 mph (25 km/h) when tow starting disabled carrier.

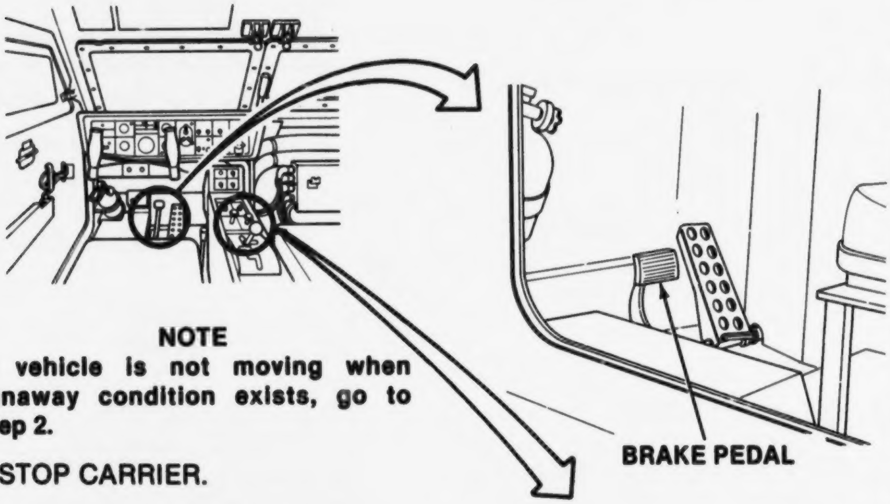
Step on brakes when being towed.

END OF TASK

IMMEDIATE ACTION TO STOP RUNAWAY ENGINE

INITIAL SETUP

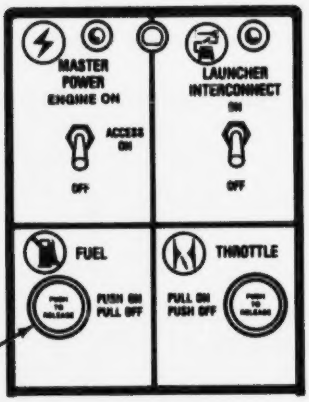
Personnel Required:	Equipment Conditions:
Driver	Engine running away


BRAKE PEDAL

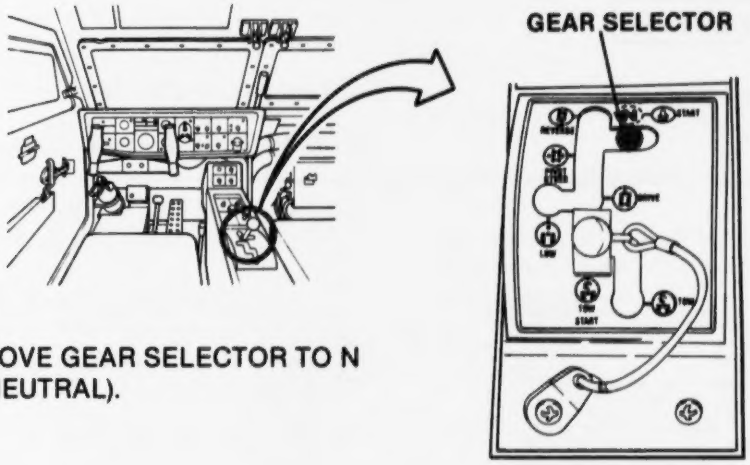
NOTE
If vehicle is not moving when runaway condition exists, go to step 2.

1. STOP CARRIER.
   a. Press down hard on brake pedal and hold.

2. TURN OFF FUEL CONTROL.
   a. Pull FUEL handle all the way out to OFF.

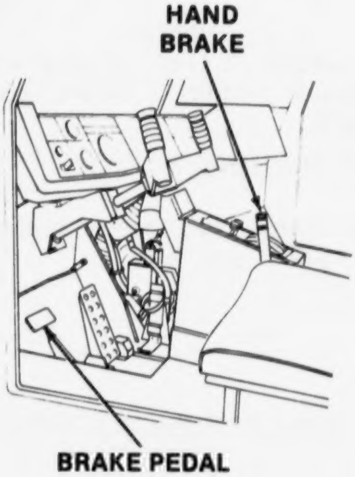

MASTER
POWER
ENGINE ON
ACCESS
ON
OFF
LAUNCHER
INTERCONNECT
ON
OFF
FUEL
PUSH TO RELEASE
PUSH ON
PULL OFF
THROTTLE
PULL ON
PUSH OFF
PUSH TO RELEASE
FUEL HANDLE

GO TO NEXT PAGE


GEAR SELECTOR
REVERSE
START
PIVOT STEER
DRIVE
LOW
TOW START
TOW

3. MOVE GEAR SELECTOR TO N (NEUTRAL).

4. SET HAND BRAKE.
   a. Push down and hold brake pedal.
   b. Pull hand brake handle back. Turn handle down.
   c. Release foot pressure.


HAND BRAKE
BRAKE PEDAL

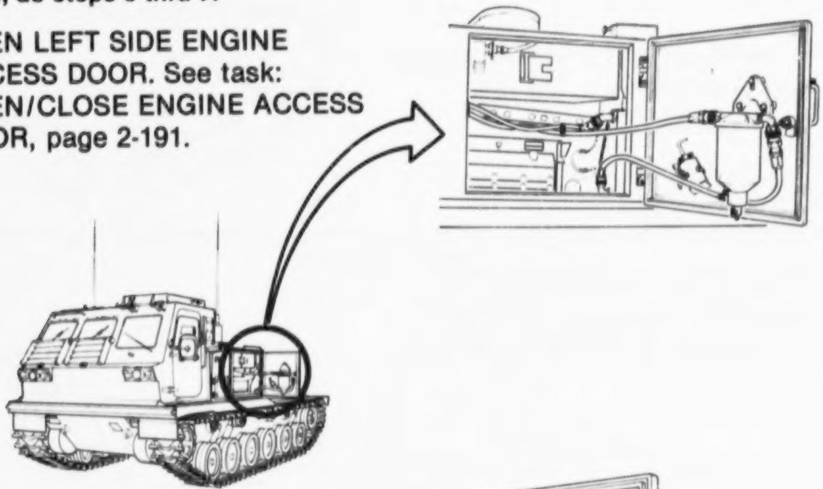
WARNING

Runaway engine can break up and throw parts. Soldiers can be killed. Make sure you open engine access door to full open and that you stay behind door when disconnecting fuel inlet hose quick disconnect. Move immediately away from carrier.

NOTE

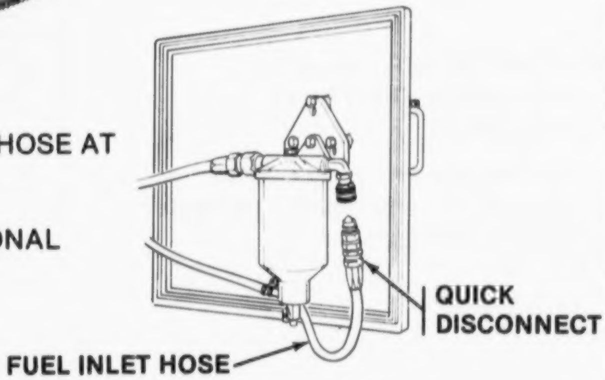
If steps 1 thru 4 stop engine, go to step 7. If steps 1 thru 4 do not stop engine, do steps 5 thru 7.

5. OPEN LEFT SIDE ENGINE ACCESS DOOR. See task: OPEN/CLOSE ENGINE ACCESS DOOR, page 2-191.



6. REMOVE FUEL INLET HOSE AT QUICK DISCONNECT.

7. NOTIFY ORGANIZATIONAL MAINTENANCE.

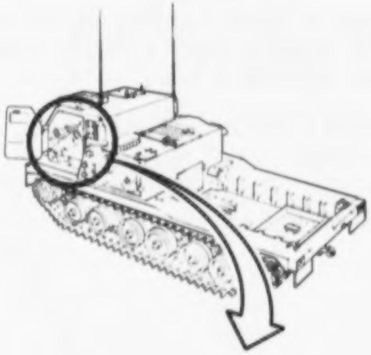


END OF TASK

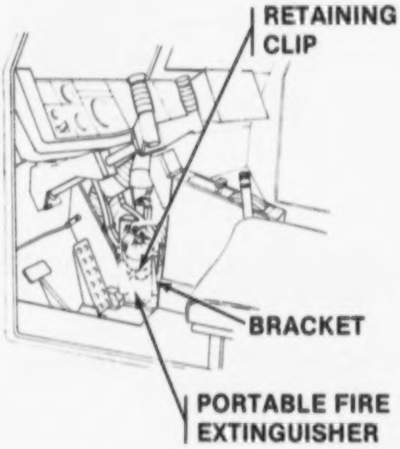
FIGHT CAB COMPARTMENT FIRE

INITIAL SETUP

Personnel Required:	Equipment Conditions:
Driver Gunner Commander	Portable fire extinguisher installed and seal is not broken



1. IF DRIVING, STOP CARRIER. See task: DRIVE CARRIER, page 2-158.
2. IF POSSIBLE, STOP ENGINE. See page 2-167.
3. TELL CREW TO EVACUATE CARRIER. See task: OPERATE INTERCOM SYSTEM, page 2-121.

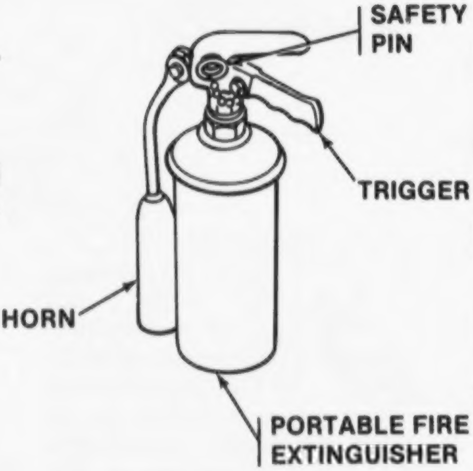


4. REMOVE PORTABLE FIRE EXTINGUISHER FROM BRACKET.
   a. Release retaining clip on bracket, and remove portable fire extinguisher.

5. EXIT CARRIER.

6. EXTINGUISH FIRE USING PORTABLE FIRE EXTINGUISHER.
   a. Pull safety pin.
   b. Point horn at base of fire, and squeeze trigger for discharge.

7. NOTIFY ORGANIZATIONAL MAINTENANCE.


SAFETY PIN
TRIGGER
HORN
PORTABLE FIRE EXTINGUISHER

END OF TASK

FIGHT ENGINE COMPARTMENT FIRE

INITIAL SETUP

Personnel Required:

Driver or Soldier

Equipment Conditions:

Engine compartment fire extinguisher is installed and seal is not broken

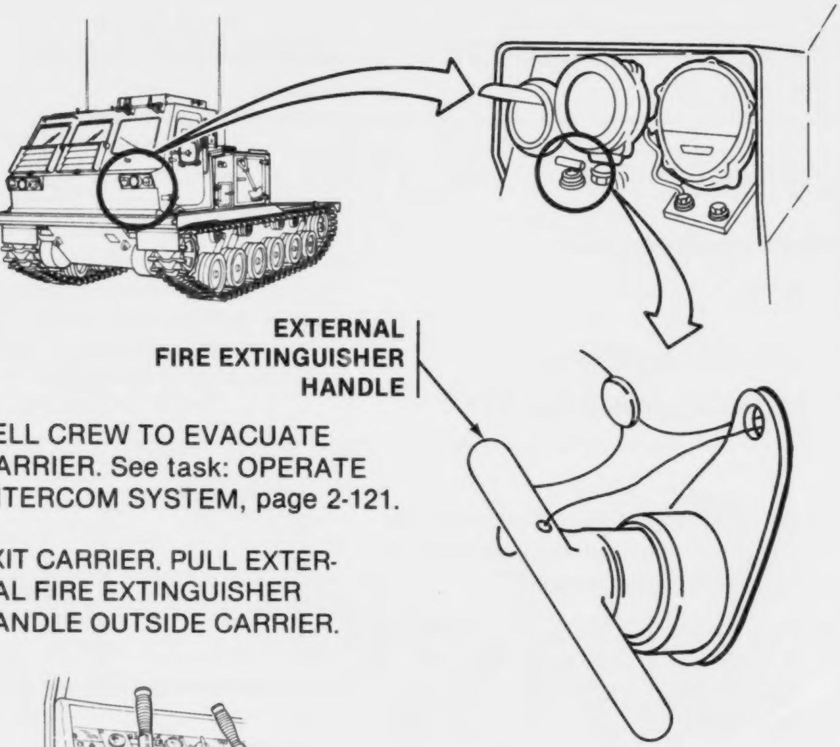
WARNING

Starting engine right after a fire could restart fire. Do not move MASTER POWER switch to ENGINE ON or ACCESS ON and/or LAUNCHER INTERCONNECT switch to ON until cause of fire has been repaired or removed.

Engine fan can blow away halon before fire is extinguished. Soldiers can get burned. Equipment can get damaged. Stop engine before you operate fire extinguisher.

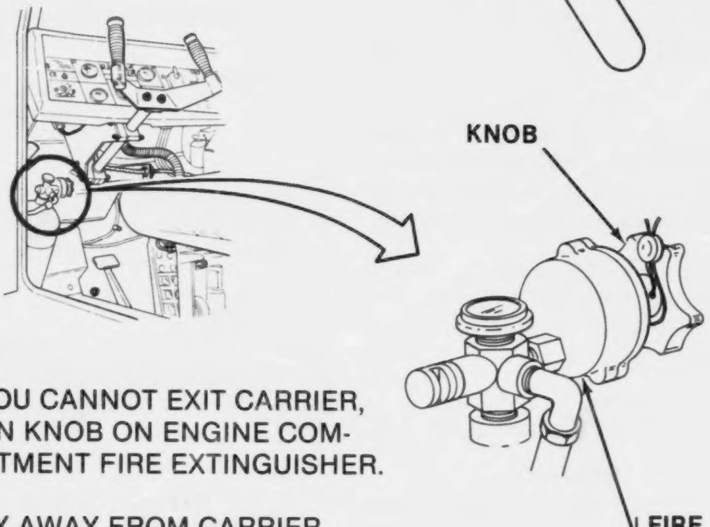
1. IF DRIVING, STOP CARRIER. See task: DRIVE CARRIER, page 2-158.

2. IF POSSIBLE, STOP ENGINE. See page 2-167.


EXTERNAL FIRE EXTINGUISHER HANDLE

3. TELL CREW TO EVACUATE CARRIER. See task: OPERATE INTERCOM SYSTEM, page 2-121.

4. EXIT CARRIER. PULL EXTERNAL FIRE EXTINGUISHER HANDLE OUTSIDE CARRIER.


KNOB
FIRE EXTINGUISHER

5. IF YOU CANNOT EXIT CARRIER, TURN KNOB ON ENGINE COMPARTMENT FIRE EXTINGUISHER.

6. STAY AWAY FROM CARRIER. NOTIFY ORGANIZATIONAL MAINTENANCE.

END OF TASK

WARM-UP PROCEDURE FOR EXTENDED ENGINE IDLING

INITIAL SETUP

Personnel Required:

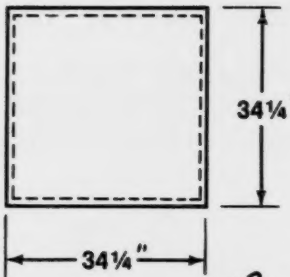
Driver

Equipment Conditions:

Engine stopped (page 2-167)

NOTE

Use cardboard, plywood, canvas scraps, or other suitable material to make intake grille cover.

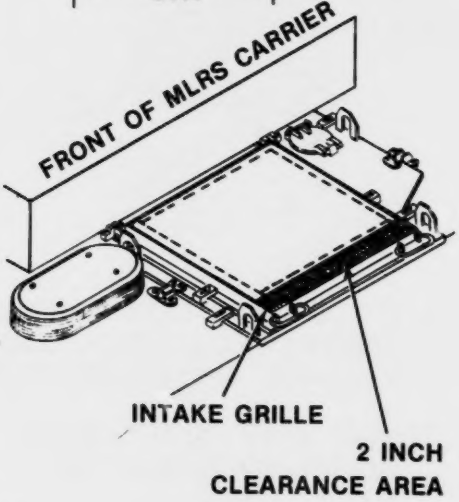


1. FABRICATE AN INTAKE GRILLE COVER FOR INTAKE GRILLE FROM UNSPECIFIED MATERIAL.

CAUTION

Always leave at least 2 inches uncovered on intake grille. Totally covering intake grille could cause overheating and damage to engine.

2. PLACE INTAKE GRILLE COVER OVER INTAKE GRILLE WITH 2 INCHES OF INTAKE GRILLE EXPOSED.



3. START ENGINE. See page 2-123.

WARNING

Do not leave vehicle unattended with engine running. Damage to equipment or injury to personnel could occur.

WARNING

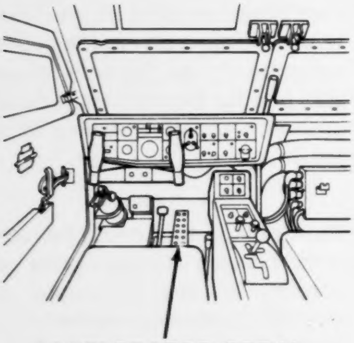
Do not move gear selector from N (neutral) when engine is above normal idle, or when transmission is not warmed up. Damage to transmission and injury to soldiers by sudden carrier movement could occur. If carrier movement is needed before completing engine warm-up, complete transmission warm-up and return engine speed to normal idle.

4. SET HAND THROTTLE.
   a. Depress accelerator pedal about 3/4 inch.
   b. Press and hold THROTTLE PUSH TO RELEASE BUTTON.
   c. Pull THROTTLE CONTROL HANDLE out until resistance is felt.
   d. Release THROTTLE PUSH TO RELEASE BUTTON.

NOTE

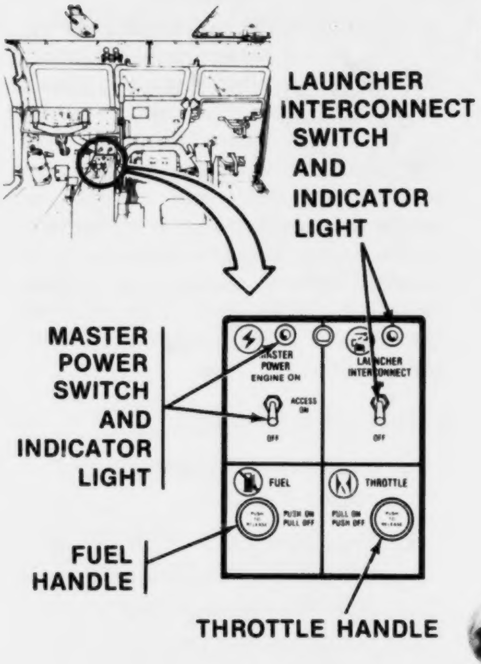
If engine speed increases after resetting hand throttle, do steps 5 and 6 with less accelerator pedal travel.

5. ALLOW ENGINE TO FAST IDLE.
   a. Allow engine to fast idle. Obtain coolant temperature readings halfway into green zone.



GO TO NEXT PAGE

6. RELEASE HAND THROTTLE.
   a. Press and hold THROTTLE PUSH TO RELEASE BUTTON.
   b. Push THROTTLE CONTROL HANDLE all the way in.
   c. Release THROTTLE PUSH TO RELEASE BUTTON.


LAUNCHER INTERCONNECT SWITCH AND INDICATOR LIGHT
MASTER POWER SWITCH AND INDICATOR LIGHT
MASTER POWER ENGINE ON
ACCESS ON
OFF
LAUNCHER INTERCONNECT
OFF
FUEL
PUSH ON PULL OFF
THROTTLE
PULL ON PUSH OFF
FUEL HANDLE
THROTTLE HANDLE

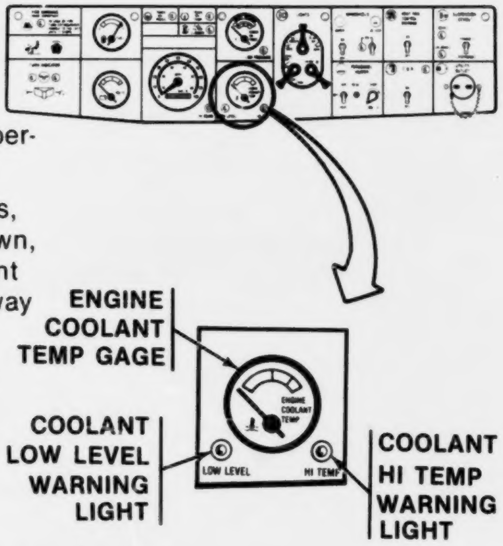
CAUTION

Power unit could be damaged from overheating due to cooling air obstruction with intake grille cover. Do not allow coolant temperatures to reach red zone on engine coolant temperature gage. Coolant temperatures can be lowered by reducing engine speed and removing intake grille cover.

NOTE

Coolant temperature could be slow to react to changes in intake grille cover adjustment or engine speed. Wait about 5 minutes after each adjustment.

7. ADJUST COOLANT TEMPERATURE.
   a. Check engine coolant temperature gage.
   b. If coolant temperature rises, slide intake grille cover down, as needed, to obtain coolant temperature readings halfway into green zone.
   c. If coolant temperature steadies or drops, recover intake grille, as needed.


ENGINE COOLANT TEMP GAGE
ENGINE COOLANT TEMP
COOLANT LOW LEVEL WARNING LIGHT
LOW LEVEL
HI TEMP
COOLANT HI TEMP WARNING LIGHT

NOTE

Engine is now ready for extended idling periods. If coolant temperature drops to 1/3 of green zone of engine coolant temperature gage, repeat steps 5 thru 7.

CAUTION

Do not operate vehicle with intake grille cover over intake grille. Power unit could overheat or engine could starve for intake air when driving carrier with cover installed. If carrier must be driven a short distance, insure that intake grille is partly uncovered. If full load operation is expected, remove cover completely.

NOTE

In cold climate, it is advisable to leave intake grille covered with intake grille cover after shutting down engine. This will keep power unit warm during periods when engine is not running.

8. STOP ENGINE. See page 2-167.

END OF TASK

CHAPTER 3
MAINTENANCE INSTRUCTIONS

Section I. LUBRICATION

UNUSUAL CONDITIONS

Extreme hot or cold weather will cause lubricants to break down. Choose lubricant suitable for expected temperature. See LO 9-1450-646-12.

Driving carrier through sand or water will cause lubricants to break down.

Check fluid levels during extreme hot or cold weather. Do not drive carrier at low lube levels, except in an emergency. Wear and corrosion will appear on carrier if lube protection is lost.

If the carrier uses too much lubricant, it must be reported to organizational maintenance.

Section II. TROUBLESHOOTING PROCEDURES

GENERAL

The TROUBLESHOOTING TABLE lists common malfunctions found while operating or servicing the carrier and its components. The TROUBLESHOOTING TABLE is divided into sections. Each section covers malfunctions common to the different systems of the carrier (e.g., engine, track, suspension, etc.).

The TROUBLESHOOTING TABLE has three divisions: MALFUNCTION, TEST OR INSPECTION, and CORRECTIVE ACTION. The MALFUNCTIONS, or systems, are numbered in sequence through the TROUBLESHOOTING TABLE. The MALFUNCTION is what will bring you to the TROUBLESHOOTING TABLE.

TEST OR INSPECTION is a step you take to isolate the MALFUNCTION. Each TEST OR INSPECTION has a CORRECTIVE ACTION. These are "if" statements which tell you what to do when the MALFUNCTION is not fixed.

When you think you have solved the problem, go back to the MALFUNCTION and recheck all steps. Check that the original MALFUNCTION is no longer there.

The manual cannot list all possible malfunctions, nor all the tests and inspections, and corrective actions. If a malfunction is not listed, or is not corrected by the listed corrective action, notify your supervisor.

The TROUBLESHOOTING SYMPTOM INDEX is below. Note that the MALFUNCTIONS are listed in alphabetical order.

TROUBLESHOOTING SYMPTOM INDEX

	Page
ENGINE	
ENGINE COOLANT TEMP gage is in red zone	3-5

GO TO NEXT PAGE

TROUBLESHOOTING SYMPTOM INDEX (cont)

ENGINE (cont) Page

COOLANT HI TEMP warning light is on 3-13

EXHAUST SYSTEM

Excessive smoke from exhaust system 3-18

TRANSMISSION SYSTEM

Transmission overheats during normal operation 3-20
TRANS OIL PRESS warning light is on 3-20

TRACK AND SUSPENSION SYSTEM

Carrier pulls to one side on level ground 3-26
Track thumps while driving 3-27
Carrier leans or bottoms while driving 3-29
Track adjuster leaks grease 3-31

PERSONNEL HEATER SYSTEM

Personnel heater will not start, or starts but shuts off 3-35
Personnel heater overheats and stops working 3-36

TROUBLESHOOTING TABLE

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

ENGINE COOLING SYSTEM

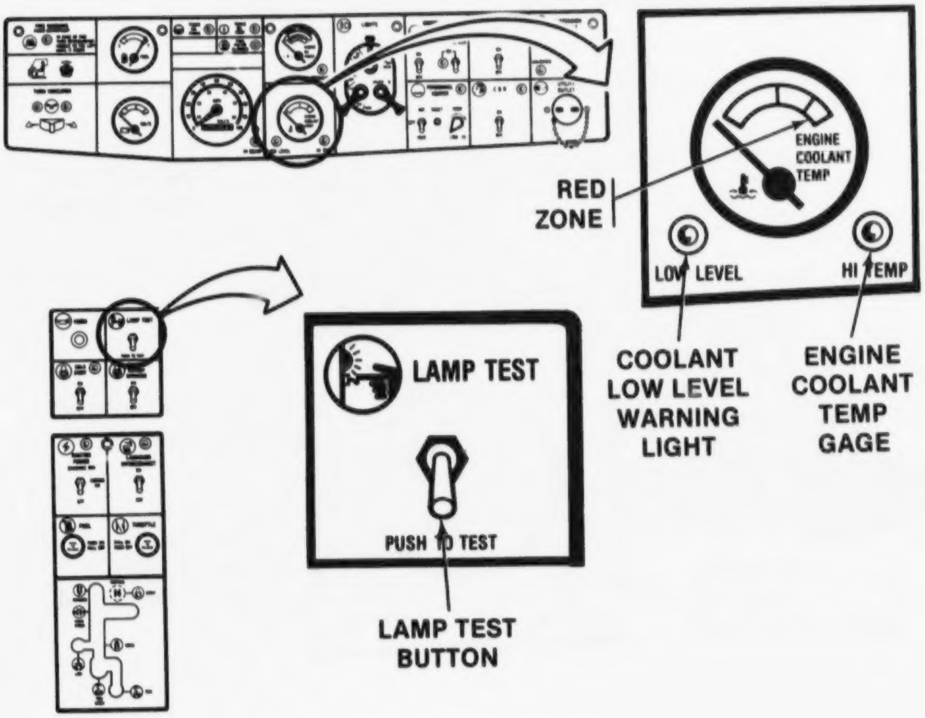
1. ENGINE COOLANT TEMP GAGE IS IN RED ZONE.

Step 1. Check that COOLANT LOW LEVEL warning light is on.

a. If COOLANT LOW LEVEL warning light is off, push LAMP TEST button. If COOLANT LOW LEVEL light does not come on, report to organizational maintenance and continue with troubleshooting.

b. If COOLANT LOW LEVEL warning light is on:

Stop engine immediately. See task: STOP ENGINE, page 2-167.


ENGINE COOLANT TEMP
RED ZONE
LOW LEVEL
HI TEMP
COOLANT LOW LEVEL WARNING LIGHT
ENGINE COOLANT TEMP GAGE
LAMP TEST
PUSH TO TEST
LAMP TEST BUTTON

GO TO NEXT PAGE

TROUBLESHOOTING TABLE (cont)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

ENGINE COOLING SYSTEM (cont)

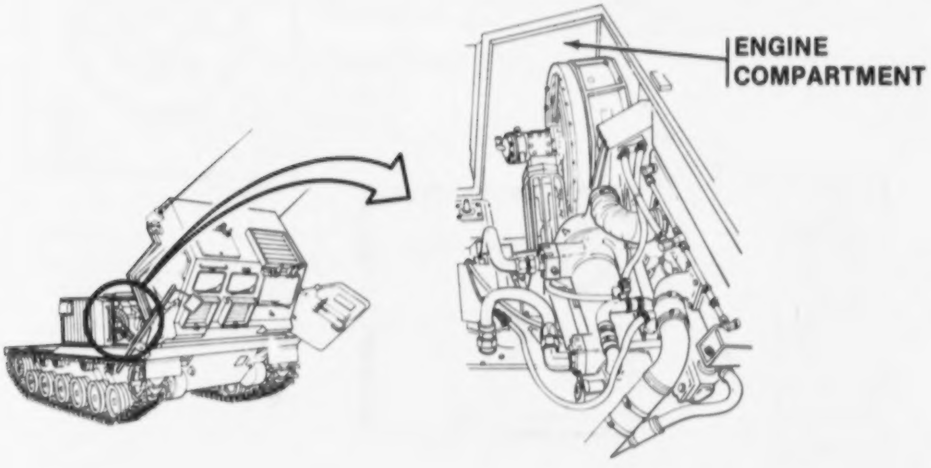
Step 2. Check cooling system for malfunction.

Raise cab. See task: RAISE/LOWER CAB, page 2-194.

WARNING

Hot power unit can burn you. Use care when working near power unit.

Check engine compartment for coolant. If coolant is found, check hoses, clamps, and fittings for coolant leaks.



MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

If leak is found, notify organizational maintenance.

If no leak is found, check coolant level. See task: CHECK/FILL RADIATOR, page 3-70.

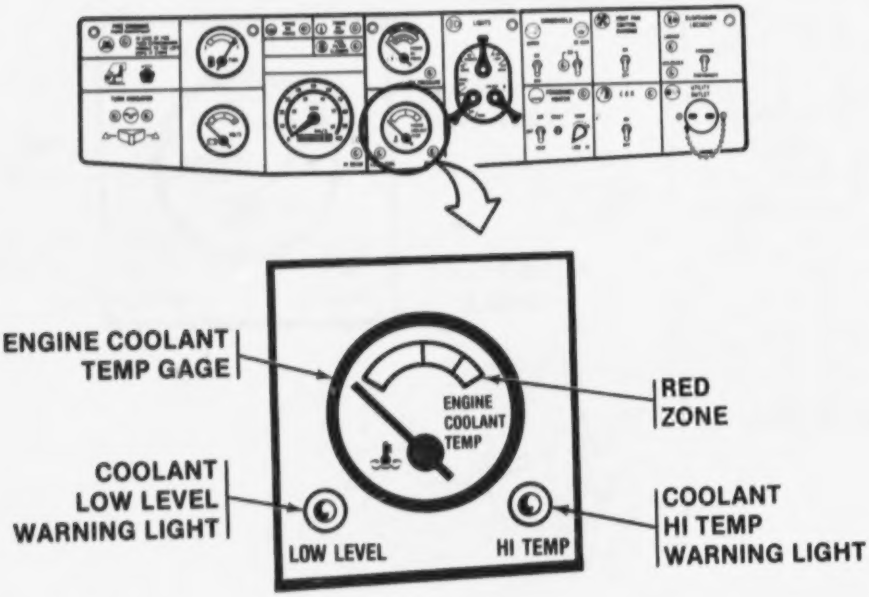
If coolant level is low and no leaks are found, notify organizational maintenance.

If coolant level is OK, coolant low level warning system is malfunctioning. Notify organizational maintenance.

Lower cab. See task: RAISE/LOWER CAB, page 2-194.

Step 3. Check that COOLANT LOW LEVEL warning light is off.

a. If ENGINE COOLANT TEMP gage is in red zone, and if COOLANT LOW LEVEL warning light and COOLANT HI TEMP warning light are off:


ENGINE COOLANT TEMP GAGE
RED ZONE
ENGINE COOLANT TEMP
COOLANT LOW LEVEL WARNING LIGHT
LOW LEVEL
HI TEMP
COOLANT HI TEMP WARNING LIGHT

GO TO NEXT PAGE

TROUBLESHOOTING TABLE (cont)

MALFUNCTION
  TEST OR INSPECTION
    CORRECTIVE ACTION

ENGINE COOLING SYSTEM (cont)

Stop carrier. See task: DRIVE CARRIER, page 2-158.

Place gear selector in N (NEUTRAL).

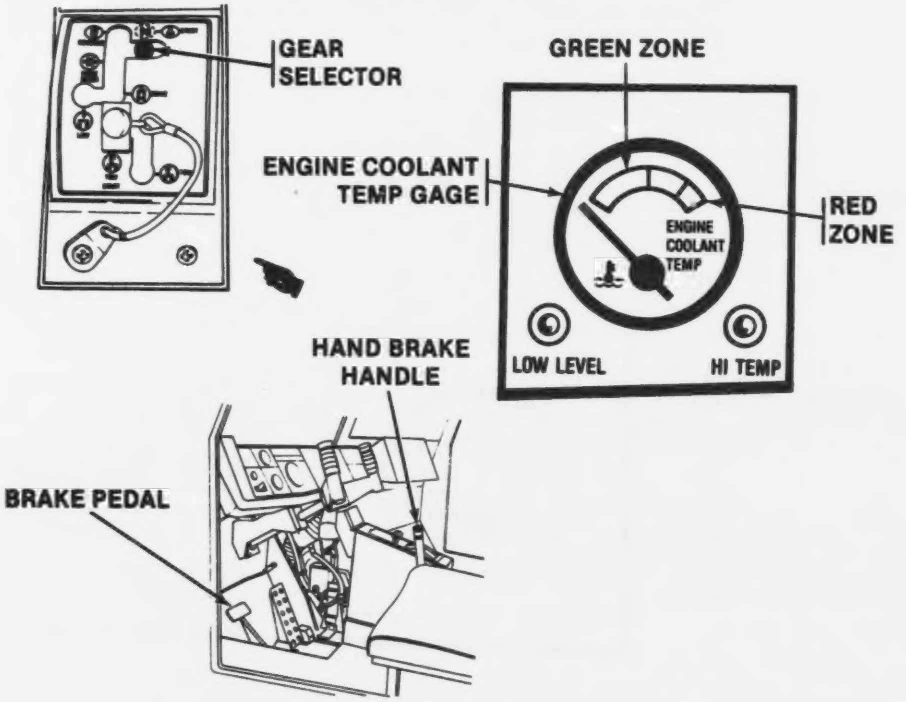
Set hand brake. Push down and hold brake pedal. Pull hand brake handle back. Release foot pressure.

Turn off all accessories.

Run engine slightly above idle. If ENGINE COOLANT TEMP gage moves into green zone, continue mission.

If ENGINE COOLANT TEMP gage remains in red zone, stop engine immediately. See task: STOP ENGINE, page 2-167.

Notify unit maintenance.


GEAR SELECTOR
GREEN ZONE
ENGINE COOLANT TEMP GAGE
RED ZONE
ENGINE COOLANT TEMP
LOW LEVEL
HI TEMP
HAND BRAKE HANDLE
BRAKE PEDAL

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 4. Check cooling system for malfunction.

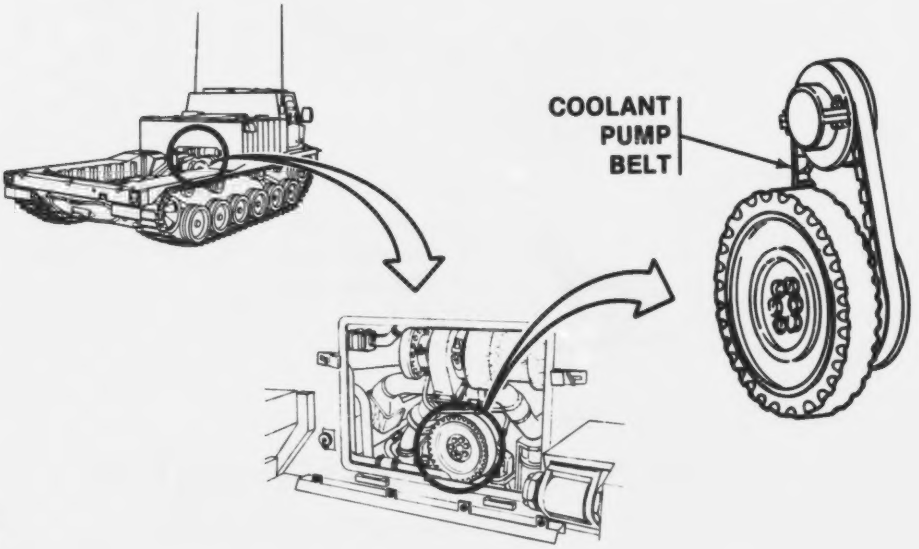
Open engine access door. See task: OPEN/CLOSE ENGINE ACCESS DOOR, page 2-191.

Remove engine access cover. See task: REMOVE/INSTALL ENGINE ACCESS COVER, page 2-192.

WARNING

Hot power unit can burn you. Use care when working near power unit.

Check for broken or loose coolant pump belt. If coolant pump belt is broken or loose, notify organizational maintenance.



GO TO NEXT PAGE

TROUBLESHOOTING TABLE (cont)

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

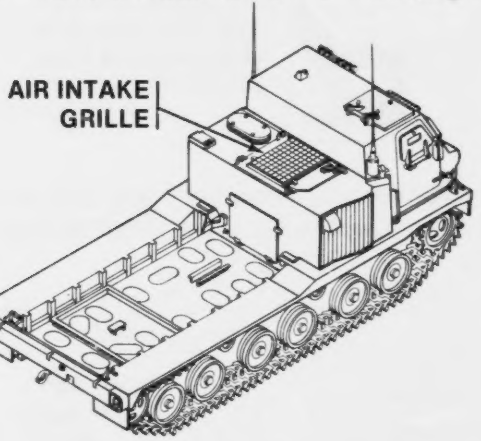
ENGINE COOLING SYSTEM (cont)

Close engine access door. See task: OPEN/CLOSE ENGINE ACCESS DOOR, page 2-191.

Install engine access cover. See task: REMOVE/INSTALL ENGINE ACCESS COVER, page 2-192.

Check for clogged air intake grille.

Clear all dirt and debris from air intake grille.



WARNING

Hot power unit can burn you. Use care when working near power unit.

Step 5. Check fan drive system.

Raise cab. See task: RAISE/LOWER CAB, page 2-194.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Remove quick release pin, and open the fan guard. Manually turn prop shaft.

If fan does not turn, fan drive system is broken.

Do not operate carrier.

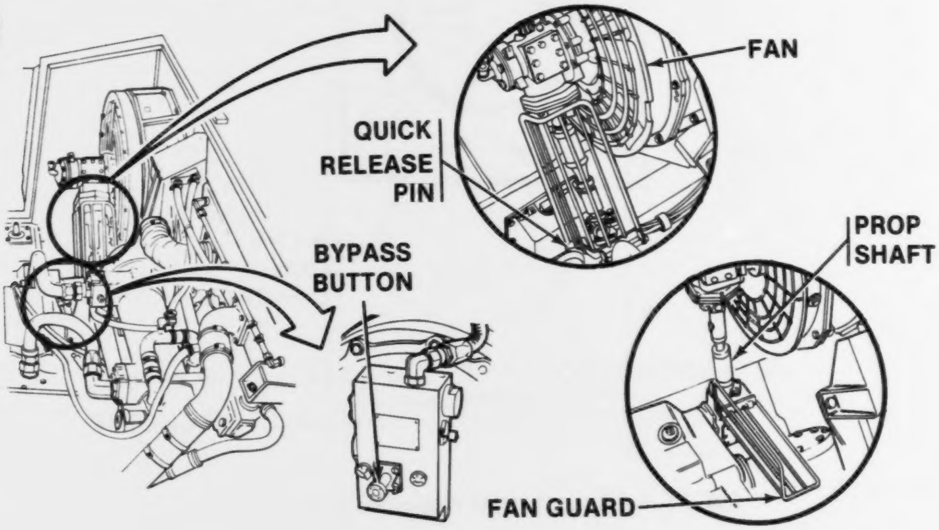
Notify organizational maintenance.

CAUTION

Quick release pin can fall and damage fan during fan operation. Make sure quick release pin is installed securely in fan guard.

If fan turns, close fan guard and install quick release pin.

Push in and lock BYPASS button.



Lower cab. See task: RAISE/LOWER CAB, page 2-194.

Start engine. See page 2-123.

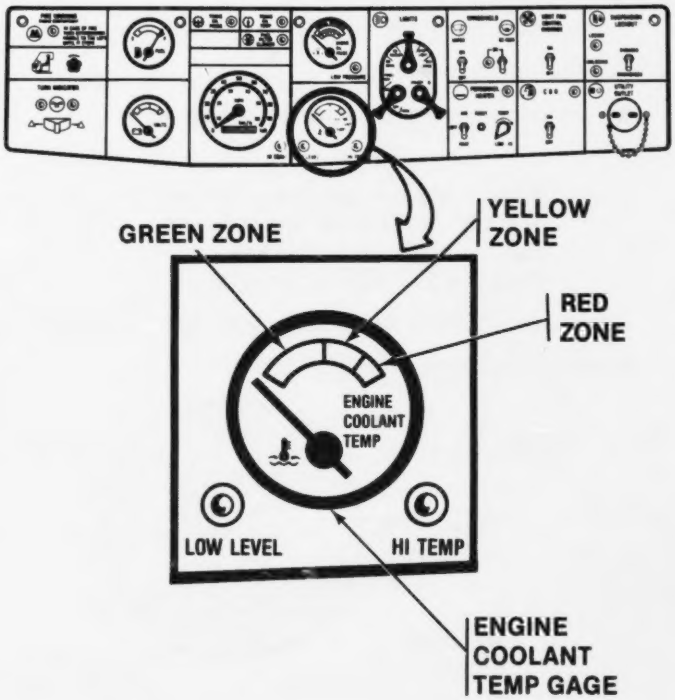
Drive carrier under similar conditions of reported overheat. See task: DRIVE CARRIER, page 2-158.

GO TO NEXT PAGE

TROUBLESHOOTING TABLE (cont)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

ENGINE COOLING SYSTEM (cont)


YELLOW ZONE
GREEN ZONE
RED ZONE
ENGINE COOLANT TEMP
LOW LEVEL
HI TEMP
ENGINE COOLANT TEMP GAGE

a. If ENGINE COOLANT TEMP gage is in red zone:

Stop engine immediately. See task: STOP ENGINE, page 2-167.

Notify organizational maintenance.

b. If ENGINE COOLANT TEMP gage remains in green zone, or yellow zone with carrier fully loaded, fan controller is malfunctioning.

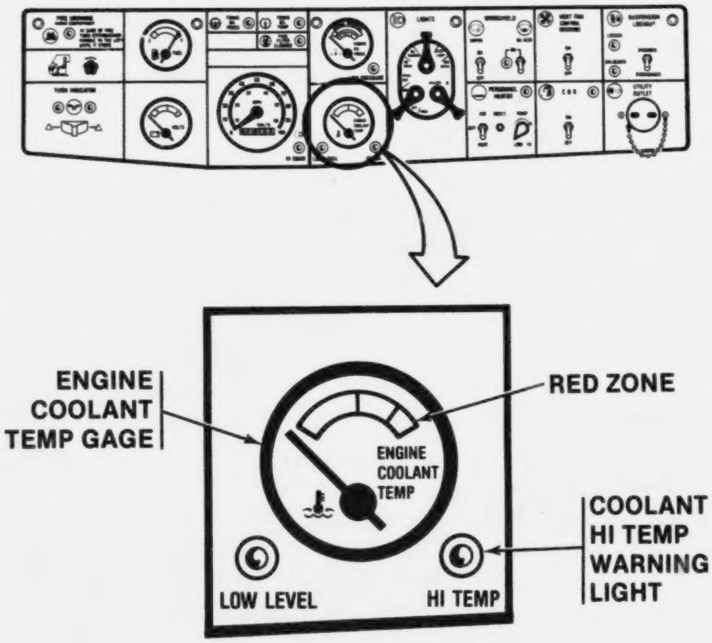
Continue mission.

Notify organizational maintenance.

1. COOLANT HI TEMP WARNING LIGHT IS ON.

Step 1. Check ENGINE COOLANT TEMP gage.

a. If COOLANT HI TEMP warning light is on and ENGINE COOLANT TEMP gage is in red zone:


ENGINE COOLANT TEMP GAGE
RED ZONE
ENGINE COOLANT TEMP
COOLANT HI TEMP WARNING LIGHT
LOW LEVEL
HI TEMP

Stop engine immediately. See task: STOP ENGINE, page 2-167.

GO TO NEXT PAGE

TROUBLESHOOTING TABLE (cont)

MALFUNCTION

TEST OR INSPECTION

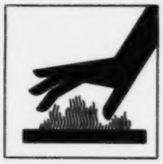
CORRECTIVE ACTION

ENGINE COOLING SYSTEM (cont)

Step 2. Check coolant system for malfunction.

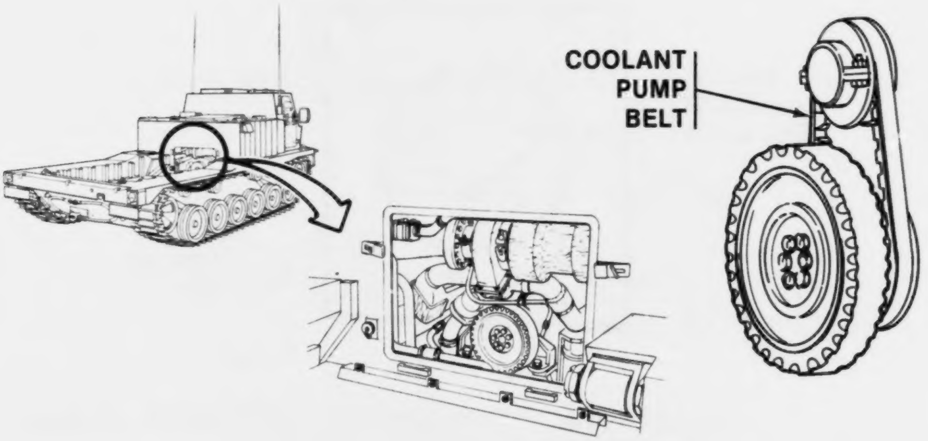
Remove engine access cover. See task: REMOVE/INSTALL ENGINE ACCESS COVER, page 2-192.

WARNING



Hot power unit can burn you. Use care when working near power unit.

Check for broken or loose coolant pump belt. If coolant pump belt is broken or loose, notify organizational maintenance.

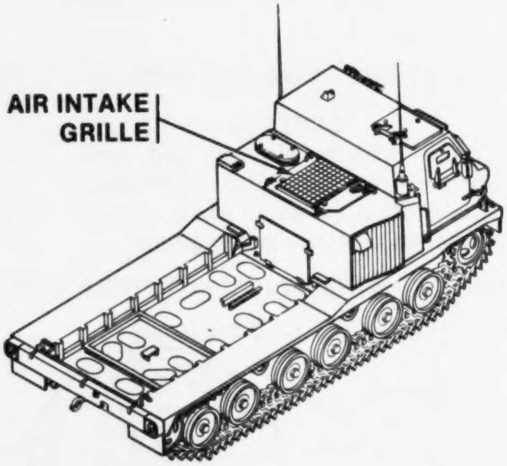


Install engine access cover. See task: REMOVE/INSTALL ENGINE ACCESS COVER, page 2-192.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Check for clogged air intake grille.

Clear all dirt and debris from air intake grille.



WARNING

Hot power unit can burn you. Use care when working near power unit.

Step 3. Check fan drive system.

Raise cab. See task: RAISE/LOWER CAB, page 2-194.

GO TO NEXT PAGE

TROUBLESHOOTING TABLE (cont)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

ENGINE COOLING SYSTEM (cont)

Remove quick release pin and open fan guard. Manually turn prop shaft.

If fan does not turn, fan drive system is broken.

Do not operate carrier.

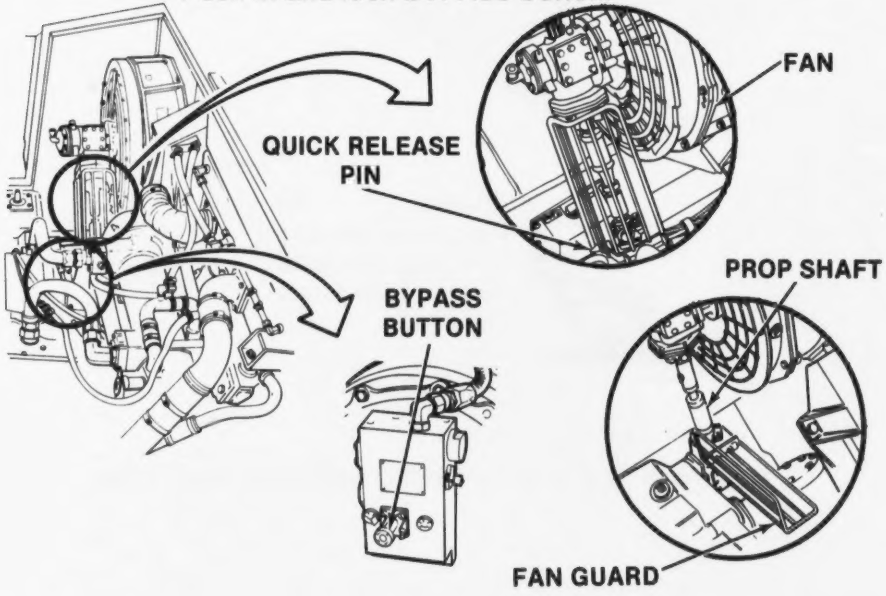
Notify organizational maintenance.

CAUTION

Quick release pin can fall and damage fan during fan operation. Make sure quick release pin is installed securely in fan guard.

If fan turns, close fan guard and install quick release pin.

Push in and lock BYPASS button.



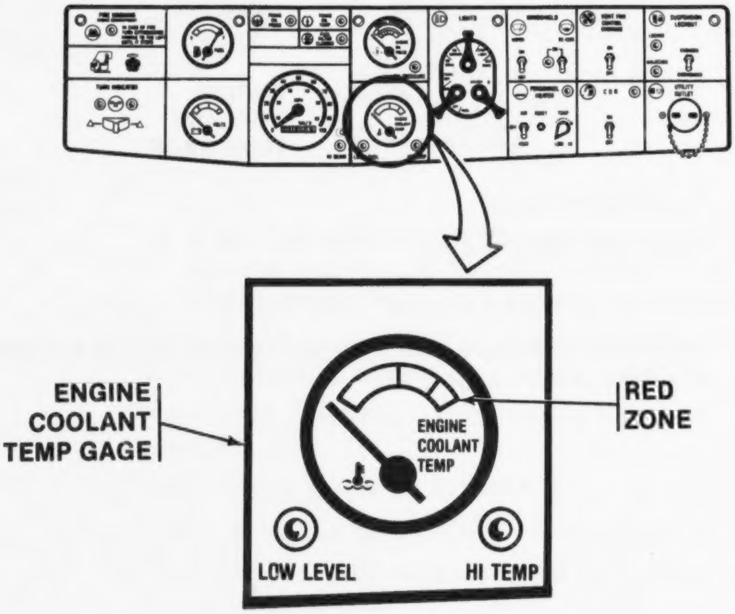
Lower cab. See task: RAISE/LOWER CAB, page 2-194.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Start engine. See page 2-123.

Drive carrier under similar conditions of reported overheat. See task: DRIVE CARRIER, page 2-158.

a. If ENGINE COOLANT TEMP gage is in red zone:


ENGINE COOLANT TEMP GAGE
RED ZONE
ENGINE COOLANT TEMP
LOW LEVEL
HI TEMP

Stop engine immediately. See task: STOP ENGINE, page 2-167.

Notify organizational maintenance.

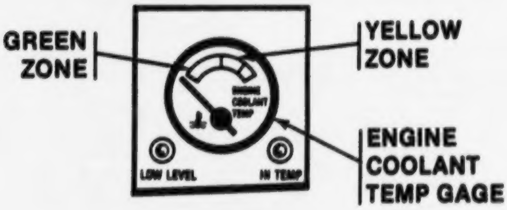
GO TO NEXT PAGE

TROUBLESHOOTING TABLE (cont)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

ENGINE COOLING SYSTEM (cont)

b. If ENGINE COOLANT TEMP gage is in green zone or yellow zone with carrier fully loaded, fan controller is malfunctioning.


GREEN ZONE
YELLOW ZONE
ENGINE COOLANT TEMP
LOW LEVEL
HI TEMP
ENGINE COOLANT TEMP GAGE

Continue mission.

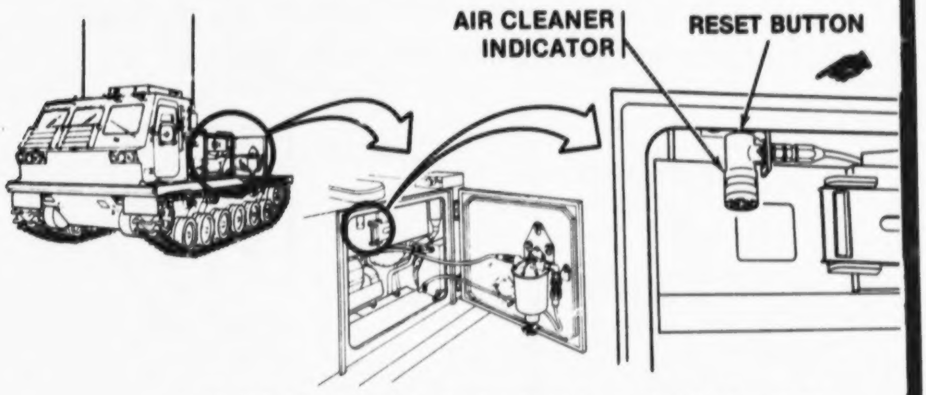
Notify unit maintenance.

3. EXCESSIVE SMOKE FROM EXHAUST SYSTEM.

Open engine access door. See task: OPEN/CLOSE ENGINE ACCESS DOOR, page 2-191.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 1. Check to see if AIR CLEANER indicator is red.



a. If AIR CLEANER indicator is red, reset it by pressing down reset button on top of indicator. Indicator will turn green.

Start engine. See task: START ENGINE/WARM UP TRANSMISSION, page 2-123.

Press down accelerator pedal fully for 5 seconds and release.

Allow engine to idle for 30 seconds.

Stop engine. See task: STOP ENGINE, page 2-167.

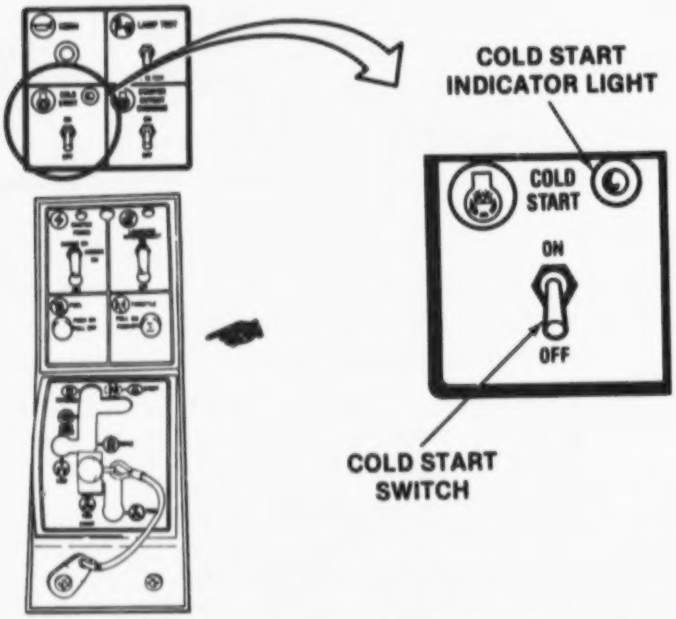
b. If AIR CLEANER indicator is red after being reset, notify unit maintenance.

GO TO NEXT PAGE

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 2. Check that COLD START indicator light is OFF.

a. If COLD START indicator light is on, notify unit maintenance.


COLD START INDICATOR LIGHT
COLD START
ON
OFF
COLD START SWITCH

b. If there is excessive smoke (white, blue, or black), notify unit maintenance.

Close engine access door. See task: OPEN/CLOSE ENGINE ACCESS DOOR, page 2-191.

GO TO NEXT PAGE

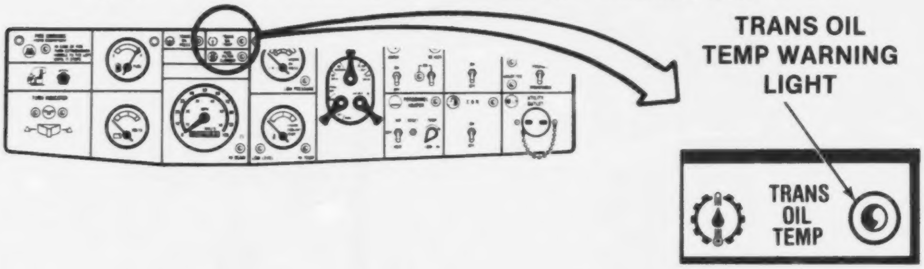
TROUBLESHOOTING TABLE (cont)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

TRANSMISSION SYSTEM

4. TRANSMISSION OVERHEATS DURING NORMAL OPERATION.

Step 1. Check that TRANS OIL TEMP warning light is off.


TRANS OIL TEMP WARNING LIGHT
TRANS OIL TEMP

a. If TRANS OIL TEMP warning light flashes or stays on, check transmission oil level. See LO 9-1450-646-12.

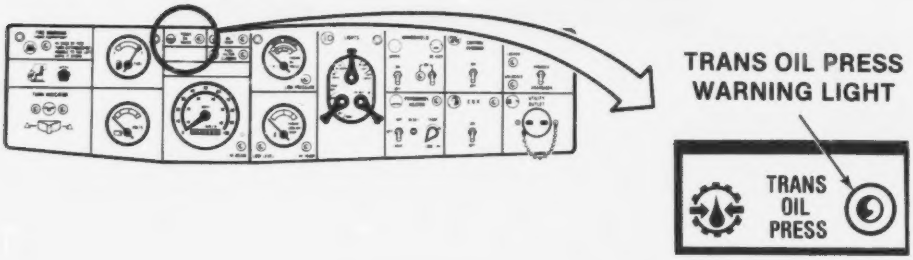
b. With proper oil level, if TRANS OIL TEMP warning light stays on, stop engine immediately. See task: STOP ENGINE, page 2-167.

Notify organizational maintenance.

5. TRANS OIL PRESS WARNING LIGHT IS ON.

Step 1. Check for transmission oil leakage.

Stop engine immediately. See task: STOP ENGINE, page 2-167.


TRANS OIL PRESS WARNING LIGHT
TRANS OIL PRESS

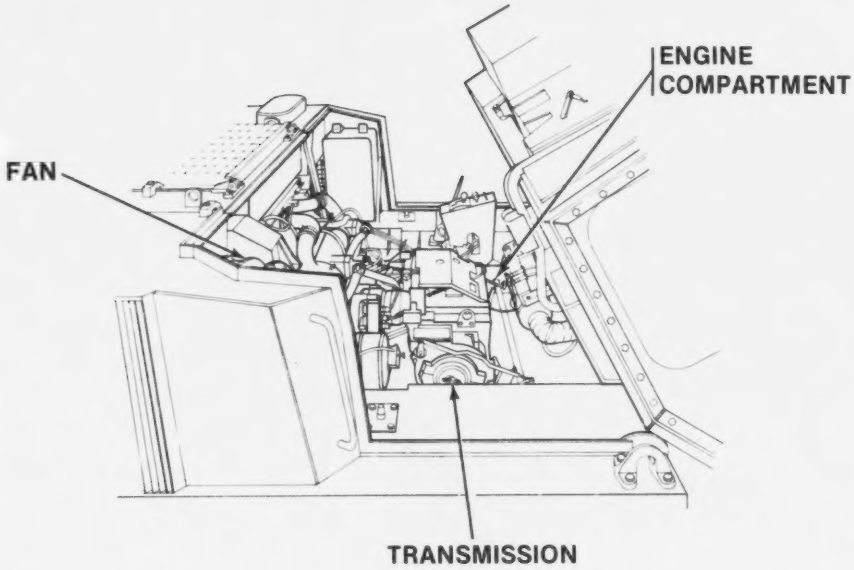
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Raise cab. See task: RAISE/LOWER CAB, page 2-194.

WARNING

Hot power unit can burn you. Use care when working near power unit.

Look for oil leaks in engine compartment, around transmission, and on fan.


ENGINE COMPARTMENT
FAN
TRANSMISSION

GO TO NEXT PAGE

TROUBLESHOOTING TABLE (cont)

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

TRANSMISSION SYSTEM (cont)

a. If transmission oil leak is found, do not operate carrier. Notify organizational maintenance.

Lower cab. See task: RAISE/LOWER CAB, page 2-194.

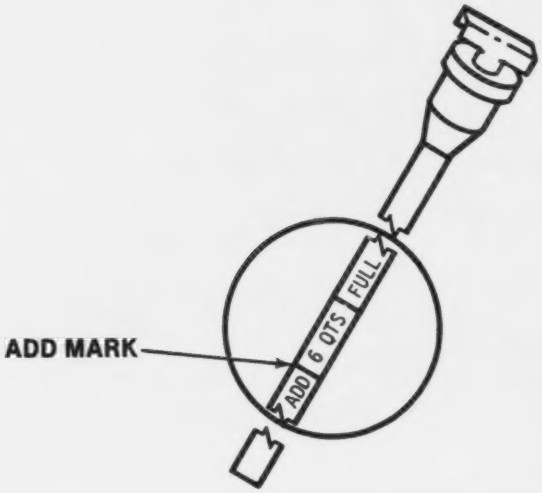
b. If no transmission oil leak is found, check transmission oil with engine off. See LO 9-1450-646-12.

If transmission oil level is at, or above ADD mark, start engine. See page 2-123.

Check transmission oil level with engine running. See LO 9-1450-646-12.

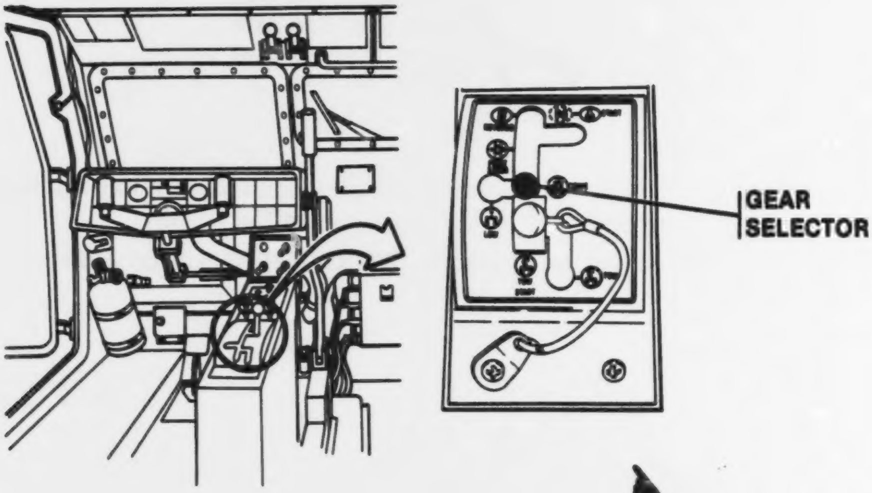
If transmission oil level is below ADD mark, stop engine. See page 2-167.

Notify organizational maintenance.



MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

If transmission oil level is above ADD mark, move gear selector to DRIVE.



Accelerate at full power to about 20 mph (30 km/h).

If acceleration feels sluggish, transmission hydraulic system is malfunctioning.

Stop engine. See page 2-167.

Notify unit maintenance. ■

GO TO NEXT PAGE

TROUBLESHOOTING TABLE (cont)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

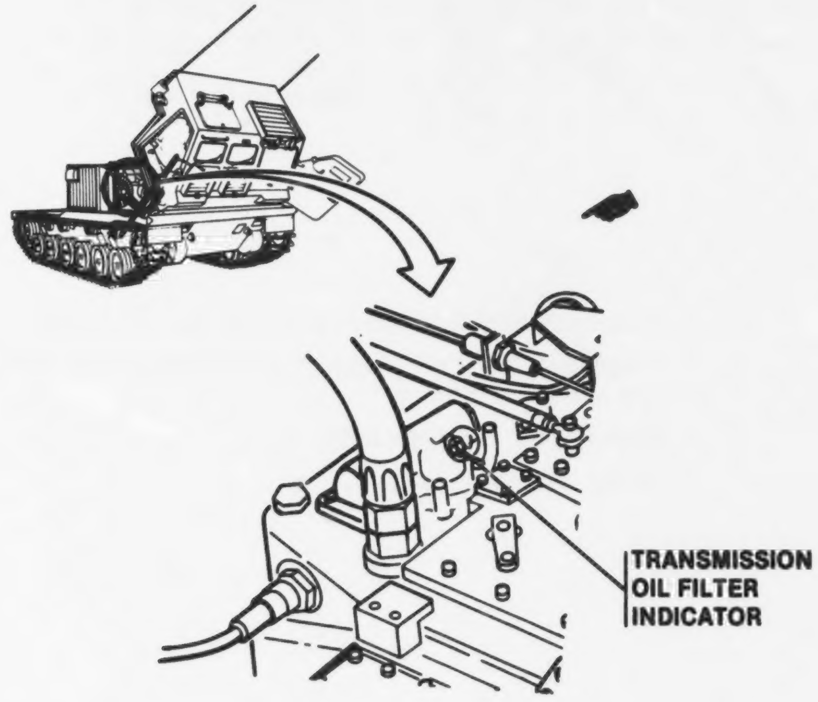
TRANSMISSION SYSTEM (cont)

WARNING

Hot power unit can burn you. Use care when working near hot power unit.

Step 2. Check that transmission oil filter indicator has not been tripped.

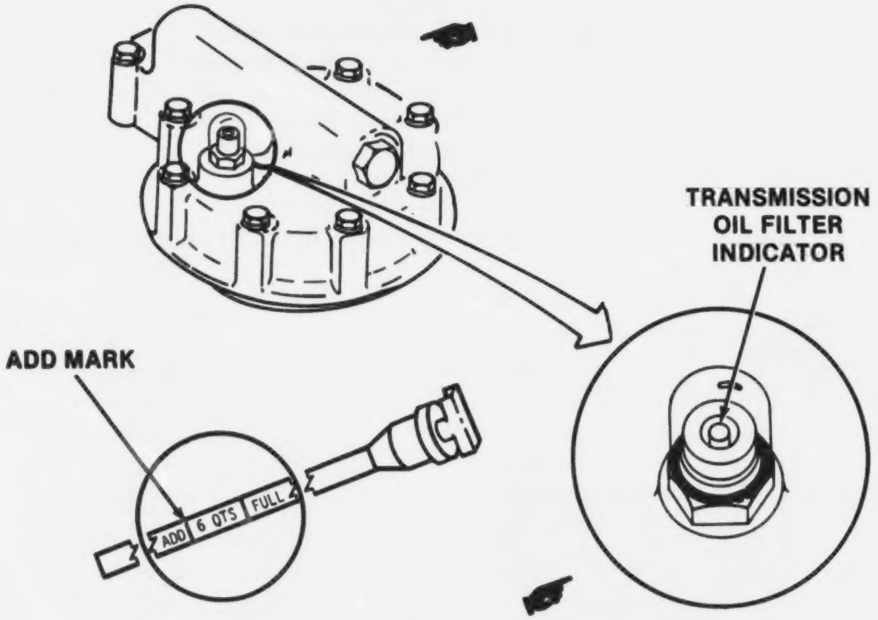
Raise cab. See task: RAISE/LOWER CAB, page 2-194.



MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

---

a. If transmission oil filter indicator has been tripped, depress it. If oil filter indicator trips again, notify unit maintenance. ■


TRANSMISSION
OIL FILTER
INDICATOR
ADD MARK
ADD
6 QTS
FULL

Lower cab. See task: RAISE/LOWER CAB, page 2-194.

If full power acceleration is normal, transmission oil filter indicator has not tripped, and transmission oil level is at or above ADD mark, transmission oil pressure warning system is malfunctioning.

Continue mission.

Notify unit maintenance. ■

GO TO NEXT PAGE

TROUBLESHOOTING TABLE (cont)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

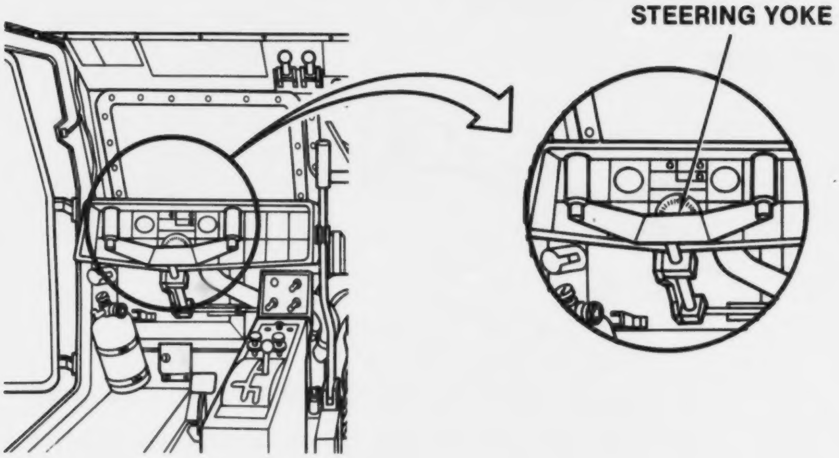
TRACK AND SUSPENSION SYSTEM

6. CARRIER PULLS TO ONE SIDE ON LEVEL GROUND.

NOTE

Carrier will pull (steer) to one side if track on that side is brand new and track on the opposite side is used track. This condition is normal and should decrease after approximately 200 miles of operation.

Step 1. Check that steering yoke returns to centered position.



Turn steering yoke to both far right and far left.

Release steering yoke from each position.

a. If steering yoke does not return to centered position, notify organizational maintenance.

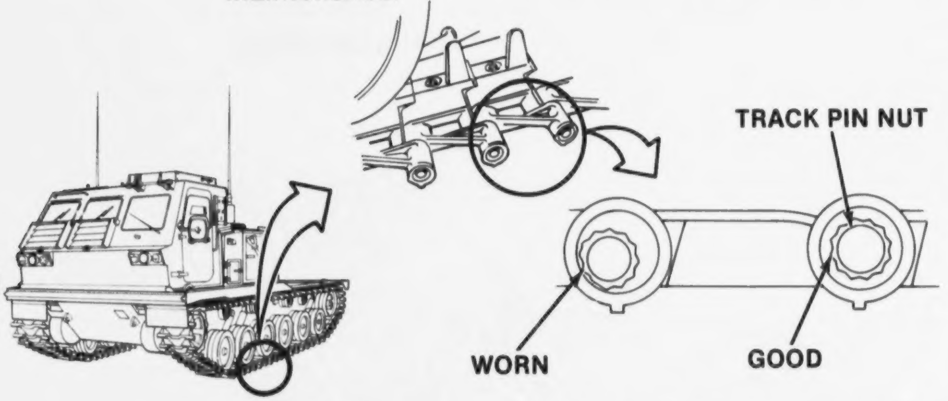
Step 2. Adjust track tension. See page 3-40.

a. If track cannot be adjusted to proper tension, notify organizational maintenance.

7. TRACK THUMPS WHILE DRIVING.

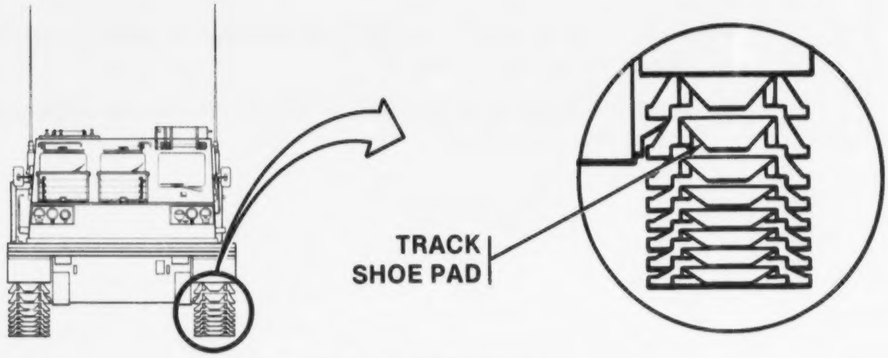
Step 1. Check that track pin nuts are centered.

a. If track pin nuts are not centered, notify organizational maintenance.



Step 2. Look at bottom of track shoe pads to see if they are worn below the metal, badly chunked, or missing.

a. If track shoe pads are worn below the metal, badly chunked, or missing, replace track shoe pads. See task: REMOVE/INSTALL TRACK SHOE PADS, page 3-65.



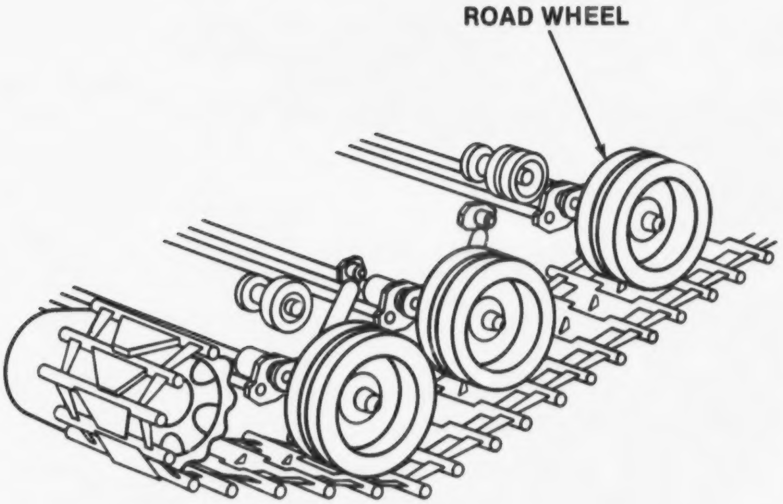
GO TO NEXT PAGE

TROUBLESHOOTING TABLE (cont)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

TRACK AND SUSPENSION SYSTEM (cont)

Step 3. Check that road wheels are not chunked or defective.



Look on bottom and round edges of road wheels for loose rubber or missing chunks.

a. If road wheels are chunked or defective, notify organizational maintenance.

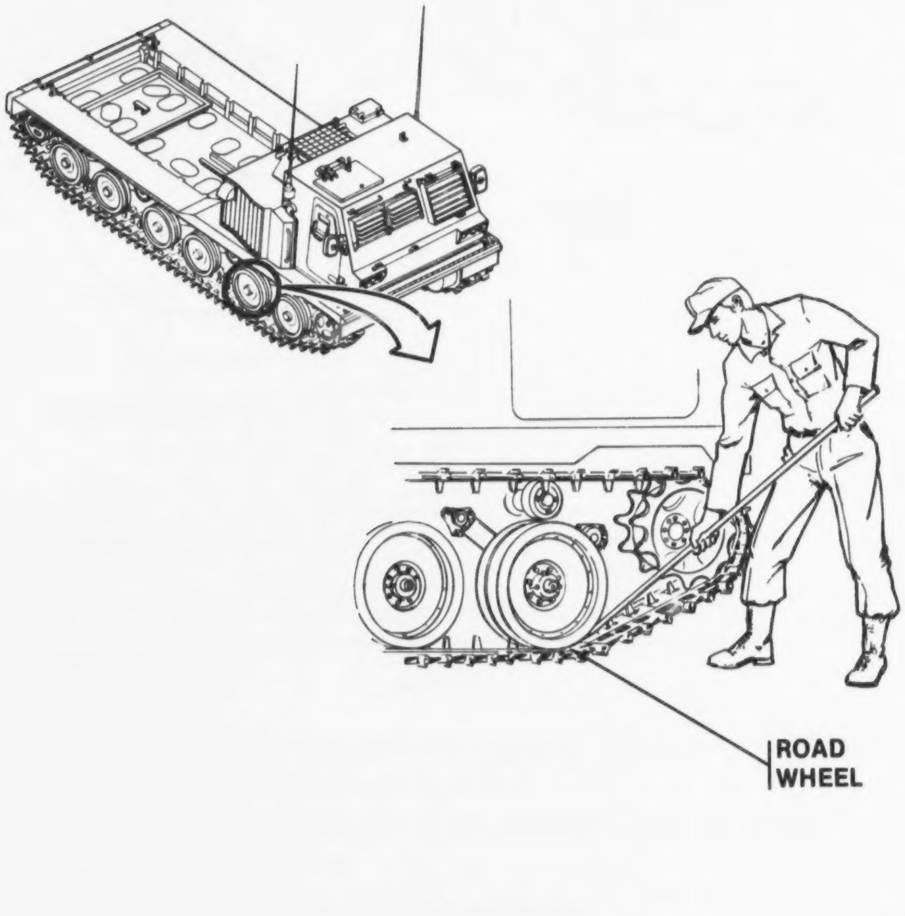
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

8. CARRIER LEANS OR BOTTOMS WHILE DRIVING.

Step 1. Check that torsion bars are not broken.

Lift each road wheel with crowbar.

a. If road wheel can be raised easily, torsion bar is broken. Notify organizational maintenance.



GO TO NEXT PAGE

TROUBLESHOOTING TABLE (cont)

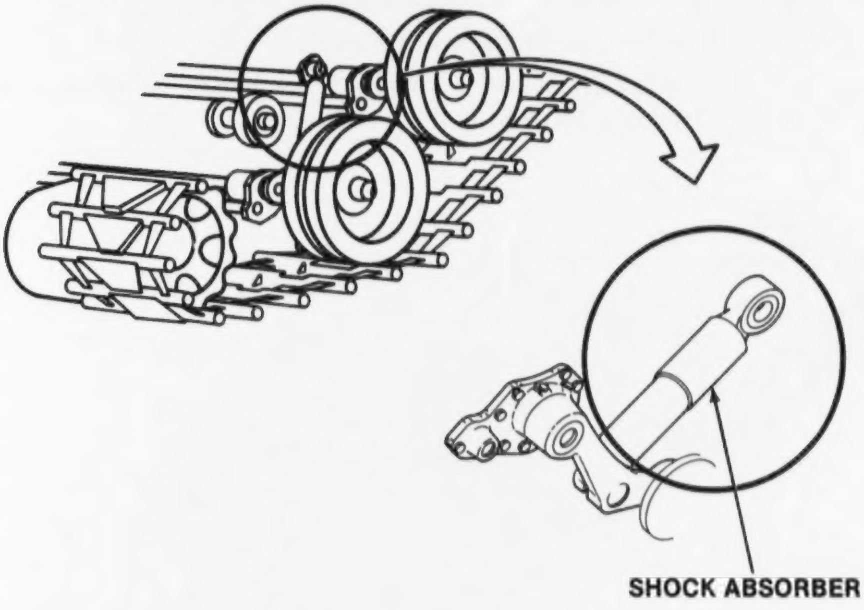
MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

TRACK AND SUSPENSION SYSTEM (cont)

Step 2. Check shock absorbers for leaks.



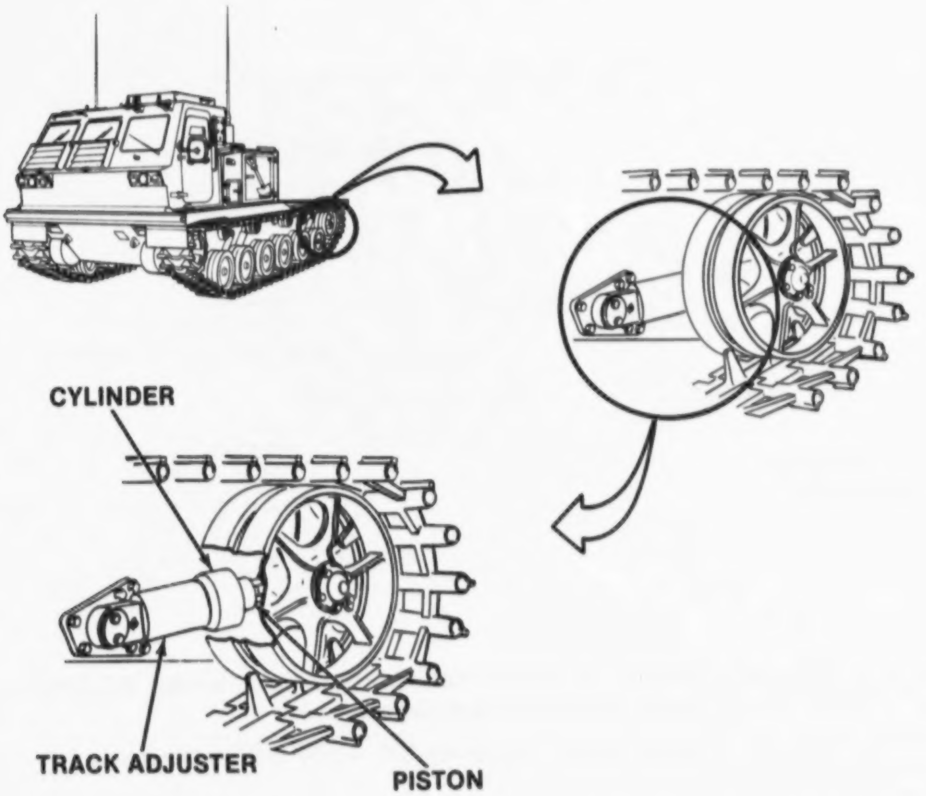
a. If shock absorbers leak, notify organizational maintenance.

b. If shock absorbers do not leak and carrier continues to bottom, notify organizational maintenance.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

9. TRACK ADJUSTER LEAKS GREASE.

Step 1. Check that track adjuster does not leak grease at point where piston fits into cylinder.



a. If track adjuster leaks grease at point where piston fits into cylinder, go to step 2.

b. If track adjuster does not leak grease, go to step 3.

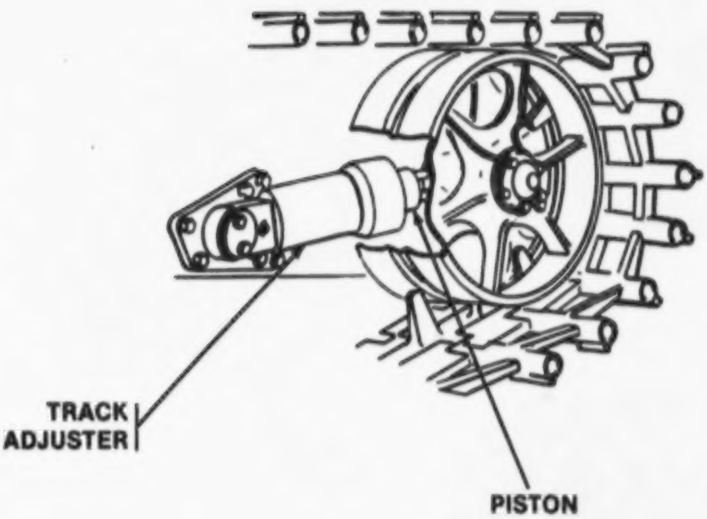
GO TO NEXT PAGE

TROUBLESHOOTING TABLE (cont)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

TRACK AND SUSPENSION SYSTEM (cont)

Step 2. Check that piston on track adjuster is not extended to its maximum position of more than 3 3/4 inches.

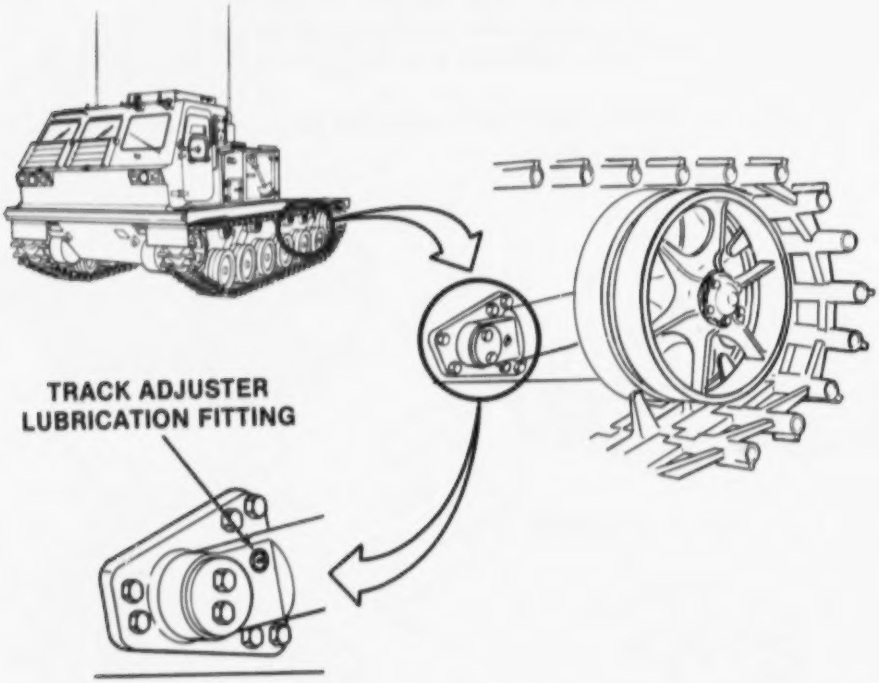


a. If piston is fully extended to 3 3/4 inches, ADJUST TRACK TENSION. See page 3-40.

b. If piston is not fully extended, notify unit maintenance.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 3. Check that track adjuster lubrication fitting does not leak.


TRACK ADJUSTER
LUBRICATION FITTING

a. If track adjuster lubrication fitting leaks, replace it. See task: REPLACE TRACK ADJUSTER LUBRICATION FITTING, page 3-68.

GO TO NEXT PAGE

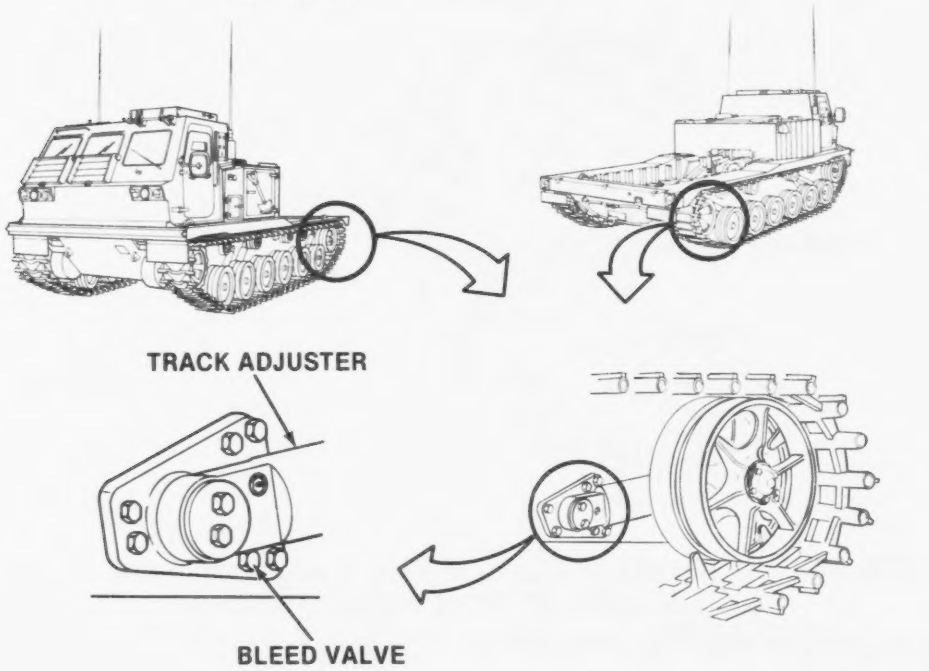
TROUBLESHOOTING TABLE (cont)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

TRACK AND SUSPENSION SYSTEM (cont)

NOTE
On right side of carrier, bleed valve is on top of track adjuster. On left side of carrier, bleed valve is on bottom of track adjuster.

Step 4. Check that track adjuster does not leak grease from bleed valve.



a. If track adjuster leaks grease from bleed valve, tighten bleed valve with 5/8 inch combination wrench.

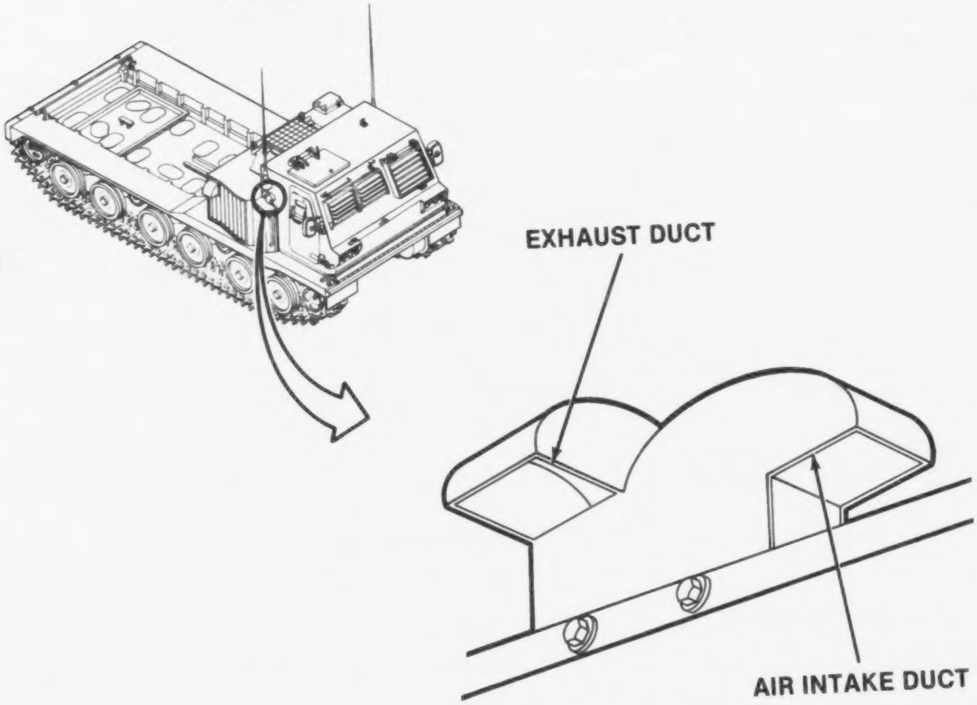
b. If track adjuster still leaks grease from bleed valve, notify organizational maintenance.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

PERSONNEL HEATER SYSTEM

11. PERSONNEL HEATER WILL NOT START, OR STARTS BUT SHUTS OFF.

Step 1. Check for clogged or blocked air intake duct on outside of cab.



Clean debris from air intake duct.

Step 2. Check for clogged or blocked exhaust duct on outside of cab.

Clean debris from exhaust duct.

GO TO NEXT PAGE

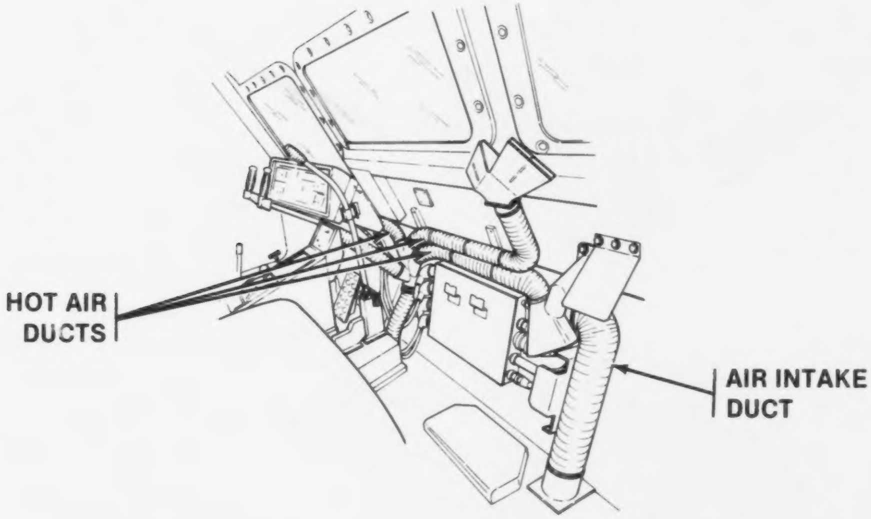
TROUBLESHOOTING TABLE (cont)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

PERSONNEL HEATER SYSTEM (cont)

12. PERSONNEL HEATER OVERHEATS AND STOPS WORKING.

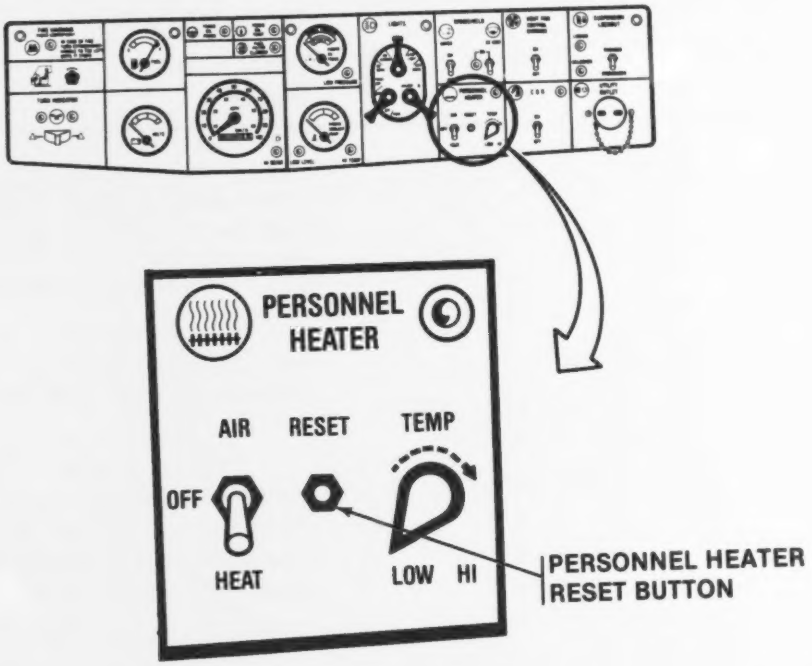
Step 1. Check that hot air ducts and air intake duct are not blocked.



a. If hot air ducts and air intake duct are blocked, clear blockage.

Let personnel heater cool.

Press PERSONNEL HEATER RESET button.


PERSONNEL HEATER
AIR
RESET
TEMP
OFF
HEAT
LOW
HI
PERSONNEL HEATER RESET BUTTON

b. If personnel heater still does not work, notify organizational maintenance.

END OF TROUBLESHOOTING

Section III. MAINTENANCE PROCEDURES

TASK INDEX

Task	Page
Block/Unblock Carrier	3-39
Adjust Track Tension	3-40
Break/Join Track	3-45
Remove/Install Track	3-54
Remove/Install Track Shoe	3-59
Remove/Install Track Shoe Pads	3-65
Replace Track Adjuster Lubrication Fitting	3-68
Check/Fill Radiator	3-70
Check Carrier Batteries	3-72

BLOCK/UNBLOCK CARRIER

INITIAL SETUP

Personnel Required:

Driver

Equipment Conditions:

Carrier parked on level surface
Hand brake set
Engine stopped (page 2-167)

WARNING

If vehicle rolls forward or backward, soldiers can be injured or killed. Make sure blocks are securely in place on track between roadwheels.

NOTE

Use rock, log, wood block, or other suitable material to make blocking device.

NOTE

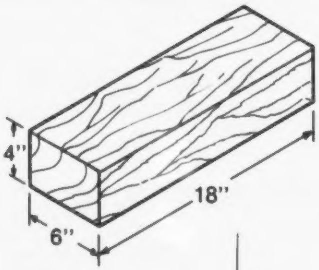
Vehicle should be on level, firm ground with hand brake set before blocks are placed on track in between roadwheels at either end of the carrier.

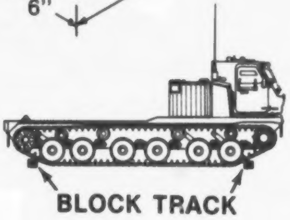
1. FABRICATE TWO BLOCKING DEVICES.

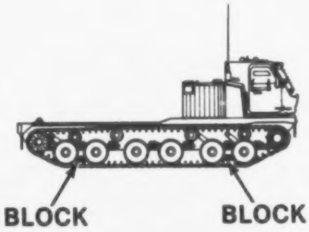
NOTE

If carrier cannot be securely blocked inside tracks, block front and rear of carrier outside of tracks. Use large blocking device.

2. BLOCK CARRIER.
   a. Place first block securely on track in between roadwheels 1 and 2 in front of carrier.







   b. Place second block on track in between roadwheels 5 and 6 in rear of carrier.

3. UNBLOCK CARRIER.
   a. Remove blocks from inside tracks in both front and back of carrier.

END OF TASK

ADJUST TRACK TENSION

INITIAL SETUP

Tools:

Open end wrench, 5/8 inch (Item 52, App B)
Lubricating gun (Item 26, App B)
Rule, 6 inch (Item 32, App B)

Materials/Parts:

Grease, GAA (Item 2, App D)
Wiping rag (Item 11, App D)
Pencil

Personnel Required:

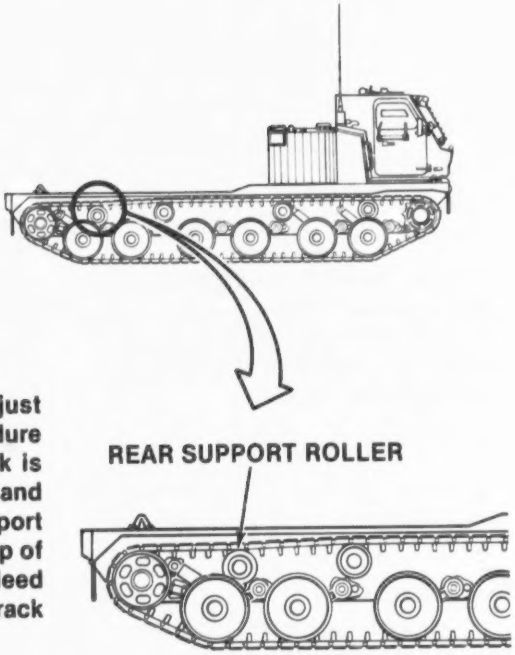
Soldier

Equipment Conditions:

Engine stopped (page 2-167)

---

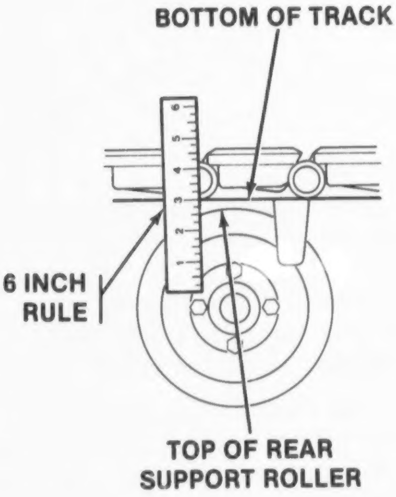
1. START ENGINE. See page 2-123.
2. DRIVE CARRIER SLOWLY TO FIRM, LEVEL GROUND. See task: DRIVE CARRIER, page 2-158.
3. STOP CARRIER. DO NOT USE STEERING YOKE OR PRESS BRAKE PEDAL TO STOP CARRIER.
4. STOP ENGINE. See page 2-167.


REAR SUPPORT ROLLER

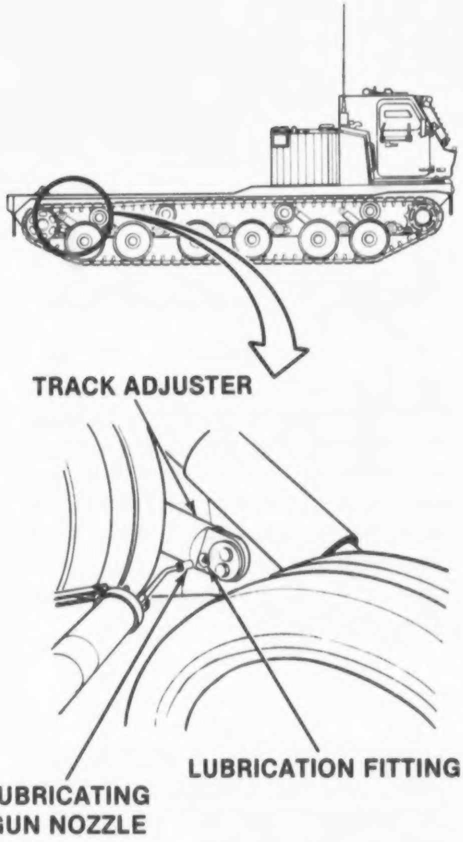
NOTE

This procedure tells you how to adjust tension on right track. The procedure for adjusting tension on left track is the same. Checks for both right and left tracks are made at rear support roller. Bleed valve is located on top of track adjuster on right track. Bleed valve is located on bottom of track adjuster on left track.

5. CHECK DISTANCE BETWEEN BOTTOM OF TRACK AND TOP OF REAR SUPPORT ROLLER. USE 6 INCH RULE.
   a. If distance is about 1/4 inch (6 mm), track does not need adjustment.
   b. If distance is less than 1/4 inch (6 mm), track is too loose. Go to step 6.
   c. If distance is more than 1/4 inch (6 mm), track is too tight. Go to step 9.


BOTTOM OF TRACK
6 INCH RULE
TOP OF REAR SUPPORT ROLLER

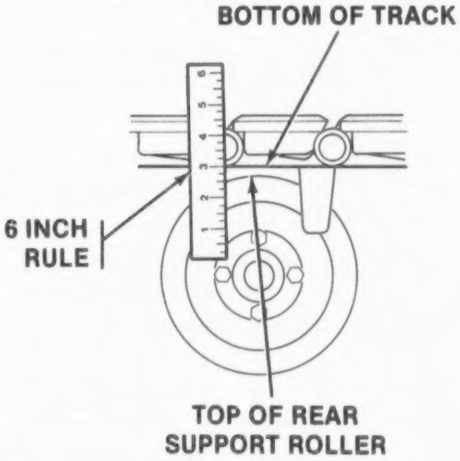
GO TO NEXT PAGE


TRACK ADJUSTER
LUBRICATION FITTING
LUBRICATING GUN NOZZLE

CAUTION

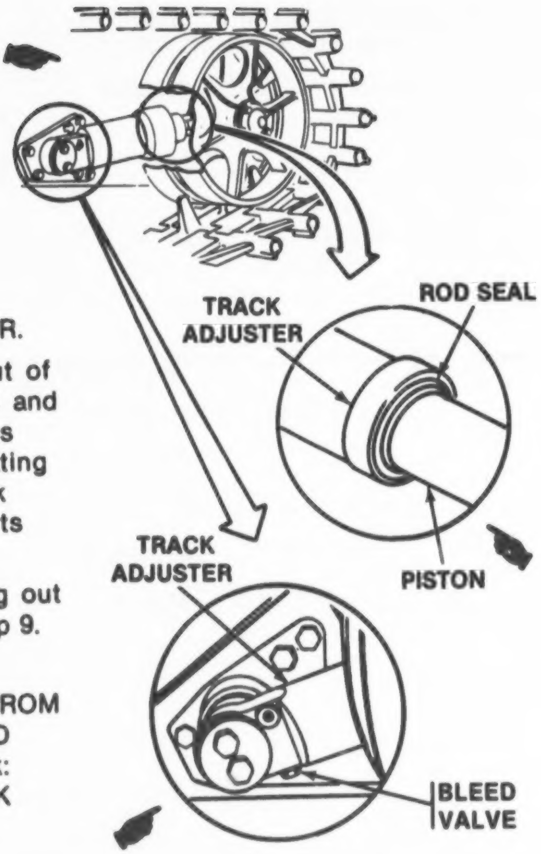
Dirt can damage lubrication fitting and cylinder. Clean all dirt from lubrication fitting on track adjuster before you attach lubricating gun to lubrication fitting.

6. TIGHTEN TRACK TENSION.
   a. Clean all dirt from lubrication fitting on track adjuster and from lubricating gun nozzle.
   b. Place lubricating gun nozzle on lubrication fitting and pump grease into track adjuster.


BOTTOM OF TRACK
6 INCH RULE
TOP OF REAR SUPPORT ROLLER

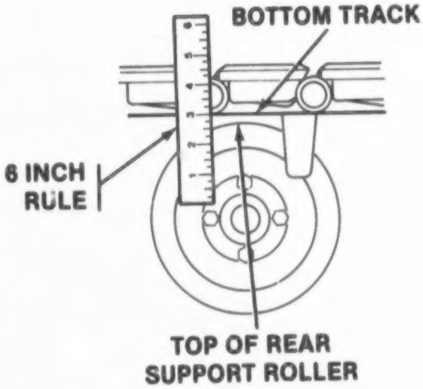
   c. Check distance between bottom of track and top of rear support roller. When distance is about 1/4 inch (6 mm), stop adding grease to track adjuster. Use 6 inch rule.
   d. Remove lubricating gun nozzle from lubrication fitting. Wipe up excess grease. Use wiping rag.
   e. If correct adjustment cannot be made, go to step 7.

GO TO NEXT PAGE


TRACK ADJUSTER
ROD SEAL
PISTON
TRACK ADJUSTER
BLEED VALVE

7. CHECK TRACK ADJUSTER.
   a. If grease is coming out of track adjuster rod seal and more than 3 1/2 inches (8.6 cm) of chrome plating on piston shows, track adjuster has reached its limit. Go to step 8.
   b. If no grease is coming out of rod seal, go to step 9.

8. REMOVE TRACK SHOE FROM STRETCHED TRACK, AND REPEAT STEP 5. See task: REMOVE/INSTALL TRACK SHOE, page 3-59.


BOTTOM TRACK
6 INCH RULE
TOP OF REAR SUPPORT ROLLER

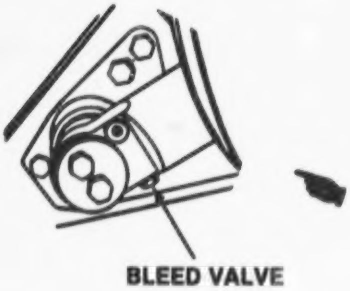
9. LOOSEN TRACK TENSION
   a. Loosen but do not remove bleed valve. Use 5/8 inch open end wrench.
   b. Let small amount of grease flow out.
   c. Check distance between bottom of track and top of rear support roller. When distance is about 1/4 inch (6 mm), stop removing grease from track adjuster. Use 6 inch rule.

GO TO NEXT PAGE

d. Tighten bleed valve. Use 5/8 inch open end wrench.

e. Wipe up excess grease. Use wiping rag.

10. DRIVE CARRIER ABOUT 100 FEET AND CHECK ADJUSTMENT OF TRACK. SEE STEPS 1 THRU 5.



END OF TASK

BREAK/JOIN TRACK

DESCRIPTION

This task covers: Break Track (page 3-45). Join Track (page 3-50).

INITIAL SETUP

Tools:

Socket handle, 3/4 inch drive (Item 23, App B)
Socket, 15/16 inch (Item 46, App B)
Open end wrench, 5/8 inch (Item 52, App B)
Open end wrench, 1 3/8 inch (Item 54, App B)
Sledge hammer (Item 21, App B)
Drift pin (Item 12, App B)
Track fixture (2) (Item 18, App B)
Crowbar (Item 9, App B)
Rule, 6 inch (Item 32, App B)
Hammer, 2 lb (Item 22, App B)

Materials/Parts:

Wiping rag (Item 11, App D)

Personnel Required:

Driver
Helper (H)

Equipment Conditions:

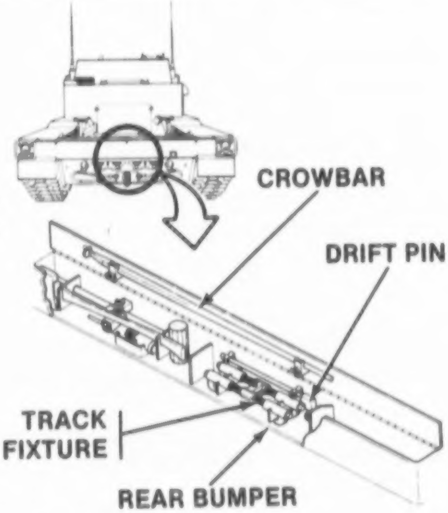
Engine stopped (page 2-167)

BREAK TRACK

NOTE

This procedure tells how to break and join left track (front). Procedure to break and join right and left tracks (front and rear) is the same.

1. UNSTOW TWO TRACK FIXTURES, DRIFT PIN, AND CROWBAR.
   a. Remove two track fixtures, drift pin, and crowbar from inside rear bumper.



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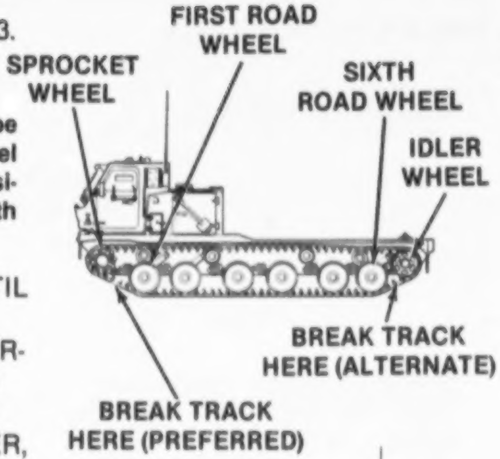
2. START ENGINE. See page 2-123.


FIRST ROAD WHEEL
SPROCKET WHEEL
SIXTH ROAD WHEEL
IDLER WHEEL
BREAK TRACK HERE (ALTERNATE)
BREAK TRACK HERE (PREFERRED)

NOTE

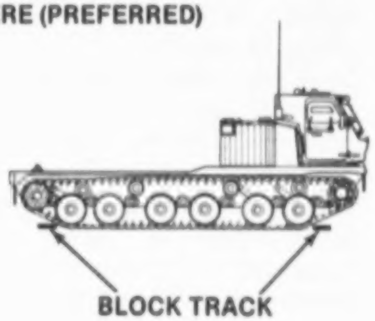
Position carrier where track shoe to be removed is between sprocket wheel and first road wheel. An alternate position is between idler wheel and sixth road wheel.

3. DRIVE CARRIER SLOWLY UNTIL TRACK BREAK POINT IS REACHED. DO NOT USE STEERING YOKE OR DO NOT PRESS BRAKE PEDAL TO STOP CARRIER. See task: DRIVE CARRIER, page 2-158.

NOTE

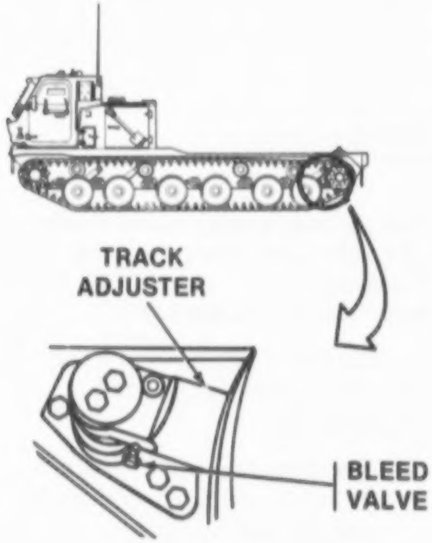
Block track with suitable object.

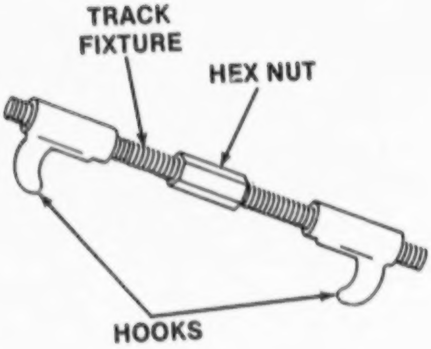
4. BLOCK TRACK NOT BEING REPAIRED.


BLOCK TRACK

5. STOP ENGINE. See page 2-167. DO NOT SET HAND BRAKE.

6. RELEASE TRACK TENSION.
   a. Loosen, but do not remove, bleed valve on track adjuster. Use 5/8 inch open end wrench.
   b. Let grease flow out.
   c. Tighten bleed valve. Use 5/8 inch open end wrench.
   d. Wipe away spilled grease. Use wiping rag.


TRACK ADJUSTER
BLEED VALVE

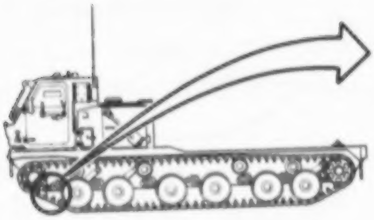

TRACK FIXTURE
HEX NUT
HOOKS

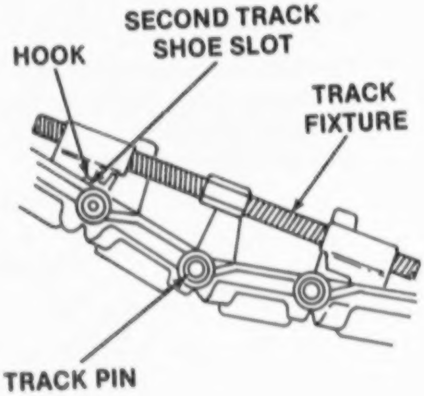
NOTE

Hex nut on track fixture must be centered between hooks.

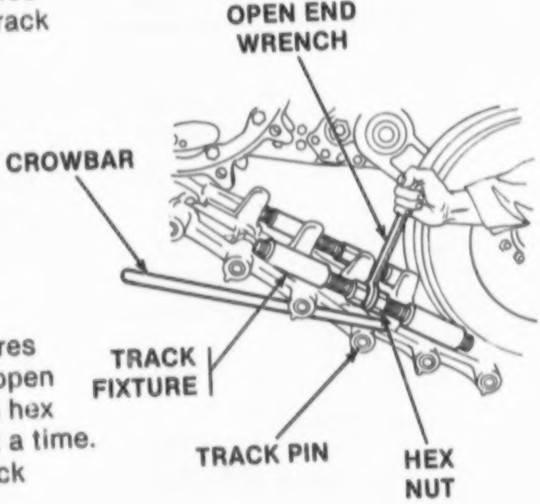
7. INSTALL TWO TRACK FIXTURES.

   a. Position hooks same distance apart at ends of two track fixtures. Turn hex nuts to position hooks.




HOOK
SECOND TRACK SHOE SLOT
TRACK FIXTURE
TRACK PIN

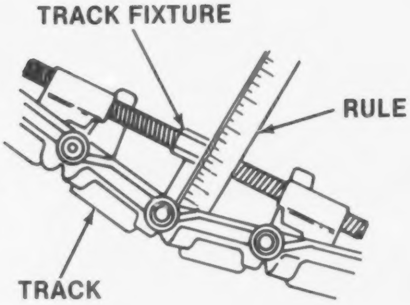
   b. Place hooks of two track fixtures in second track shoe slots on either side of track pin.


OPEN END WRENCH
CROWBAR
TRACK FIXTURE
TRACK PIN
HEX NUT

   c. Tighten two track fixtures evenly. Use 1 3/8 inch open end wrench. Turn each hex nut about four turns at a time. Use crowbar to pry track down.

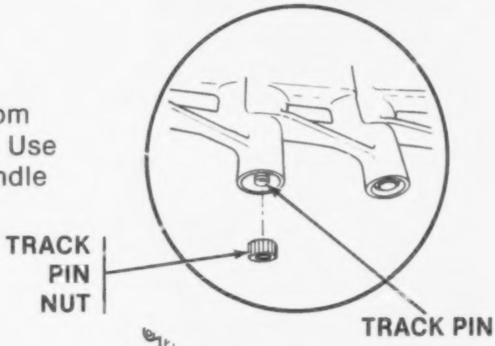
GO TO NEXT PAGE

d. Measure gap between track fixture and track. Use 6 inch rule. Gap should be about 1 1/2 inches.

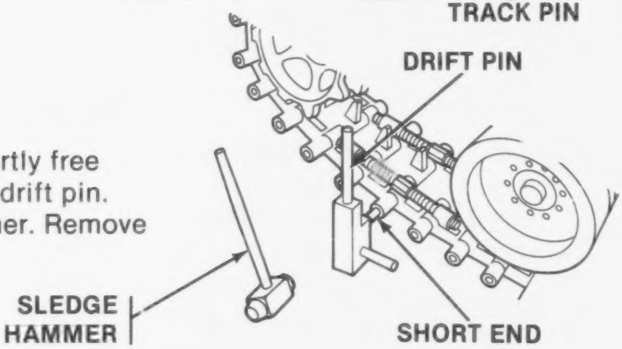

TRACK FIXTURE
RULE
TRACK

8. BREAK TRACK.

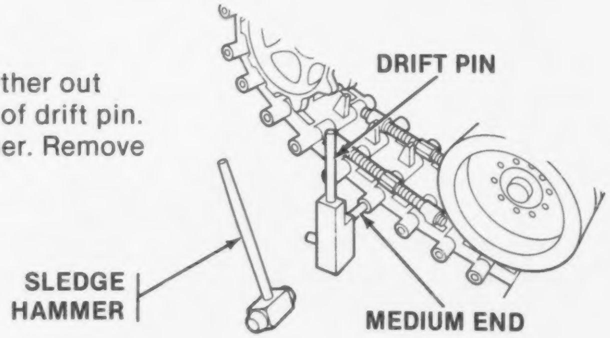
a. Remove track pin nut from track pin to be removed. Use 3/4 inch drive socket handle and 15/16 inch socket.


TRACK PIN NUT
TRACK PIN

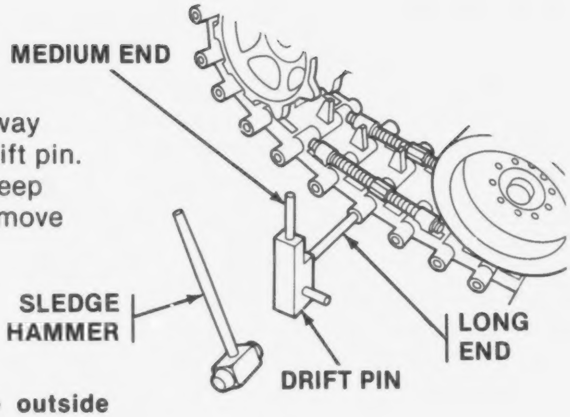
b. Drive track pin partly free with short end of drift pin. Use sledge hammer. Remove drift pin.


DRIFT PIN
SLEDGE HAMMER
SHORT END

c. Drive track pin farther out with medium end of drift pin. Use sledge hammer. Remove drift pin.


DRIFT PIN
SLEDGE HAMMER
MEDIUM END

d. Drive track pin all the way out with long end of drift pin. Use sledge hammer. Keep medium end up and remove drift pin.


MEDIUM END
SLEDGE HAMMER
LONG END
DRIFT PIN

NOTE

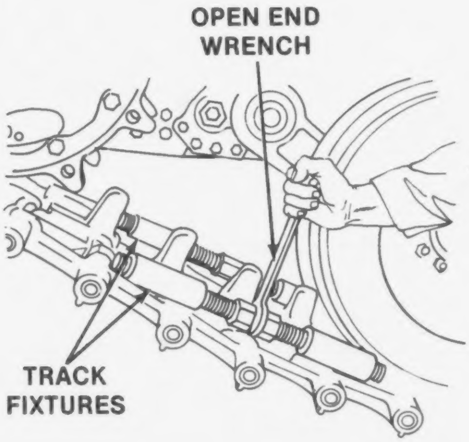
If track separates before outside track fixture is removed, use crowbar in sprocket to close gap in track while removing fixture.

Inside track fixture is removed first.

9. REMOVE TWO TRACK FIXTURES.

a. Loosen inside track fixture. Use 1 3/8 inch open end wrench. Remove inside track fixture.

b. Loosen outside track fixture. Use 1 3/8 inch open end wrench. Remove outside track fixture.

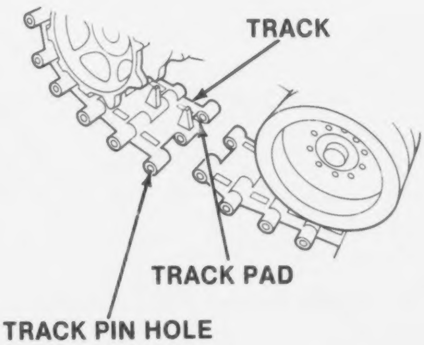

OPEN END WRENCH
TRACK FIXTURES

WARNING

You could be injured if track swings out and hits you. Do not stand in front of track being broken.

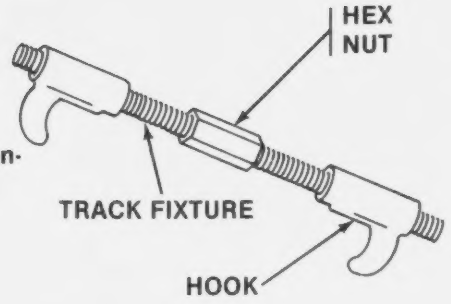
10. DISCONNECT TRACK.

a. Hit track pad inside track near track pin hole to break track apart. Use sledge hammer.


TRACK
TRACK PAD
TRACK PIN HOLE

GO TO NEXT PAGE

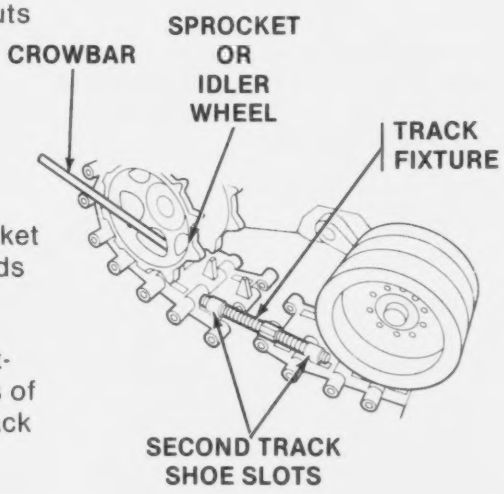
JOIN TRACK


HEX NUT
TRACK FIXTURE
HOOK

NOTE
Hex nut on track fixture must be centered between hooks.

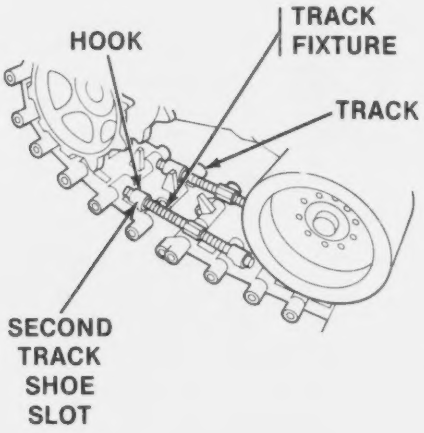
11. INSTALL TWO TRACK FIXTURES.

    a. Position hooks same distance apart at ends of two track fixtures. Turn hex nuts to position hooks.


CROWBAR
SPROCKET OR IDLER WHEEL
TRACK FIXTURE
SECOND TRACK SHOE SLOTS

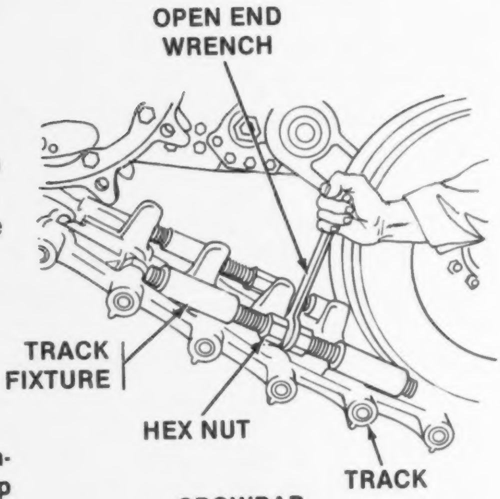
    b. (H) Hold crowbar in sprocket or idler wheel to move ends of track together.

    c. Install track fixture on outside of track. Place hooks of track fixture in second track shoe slots.


HOOK
TRACK FIXTURE
TRACK
SECOND TRACK SHOE SLOT

    d. Install track fixture on inside of track. Place hooks of track fixture in second track shoe slots.

e. Tighten two track fixtures evenly. Use 1 3/8 inch open end wrench. Turn two hex nuts until ends of track are about 1/16 inch apart. Use 6 inch rule.


OPEN END WRENCH
TRACK FIXTURE
HEX NUT
TRACK

CAUTION

Track pin threads are easily damaged. Do not force track pin. Tap track pin lightly with hammer.

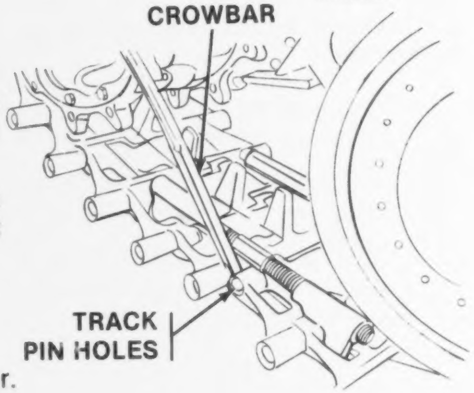
NOTE

If track is difficult to join, step 6 can be repeated to release more track tension.

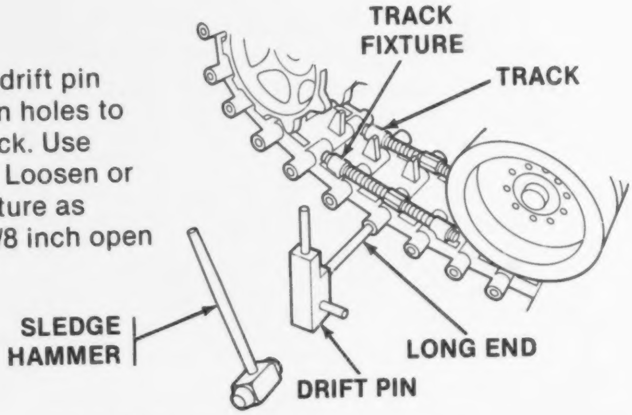
As track pin moves through track pin hole, track pin will push drift pin out ahead of it.

12. JOIN TRACK.

a. Aline track pin holes. Use crowbar and sledge hammer.


CROWBAR
TRACK PIN HOLES

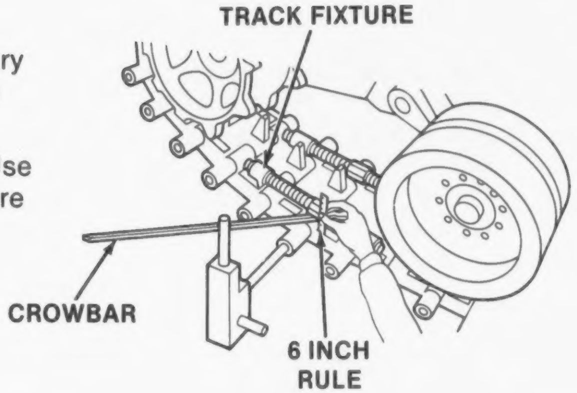
b. Tap long end of drift pin through track pin holes to other side of track. Use sledge hammer. Loosen or tighten track fixture as needed. Use 1 3/8 inch open end wrench.


TRACK FIXTURE
TRACK
SLEDGE HAMMER
LONG END
DRIFT PIN

GO TO NEXT PAGE

c. (H) Use crowbar to pry and hold track down 1 1/2 inches.

d. Measure distance. Use 6 inch rule to measure distance.


TRACK FIXTURE
CROWBAR
6 INCH RULE

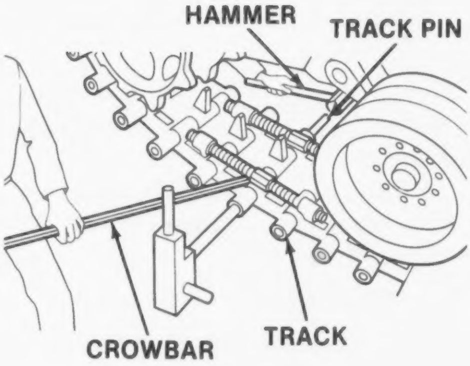
NOTE

One track pin nut must be on track pin with one thread showing before installation.

e. From inside of track, install track pin in track pin hole.

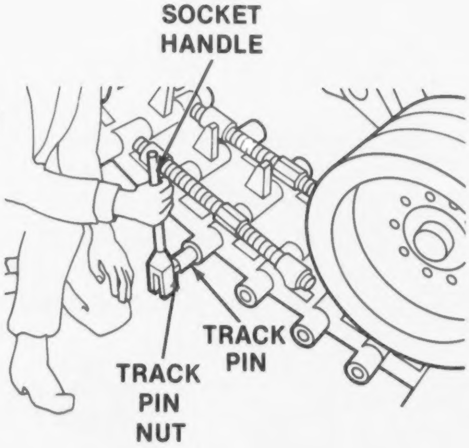
f. (H) Aline track pin holes with crowbar.

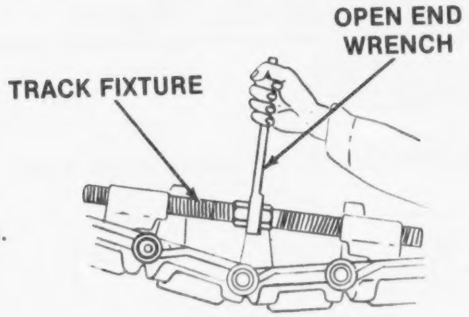
g. Lightly tap in track pin. Drive track pin all the way through track. Use hammer.


HAMMER
TRACK PIN
CROWBAR
TRACK

h. Install and tighten track pin nut on track pin until one full thread shows on track pin. Use 3/4 inch drive socket handle and 15/16 inch socket.

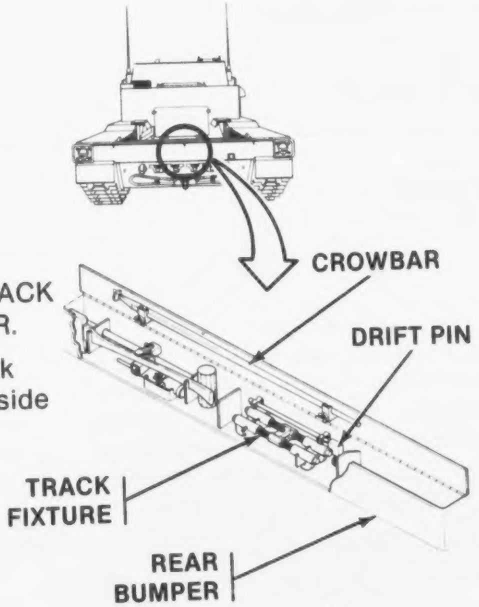
i. Mark track pin nut so organizational maintenance can torque it.


SOCKET HANDLE
TRACK PIN
TRACK PIN NUT


OPEN END WRENCH
TRACK FIXTURE

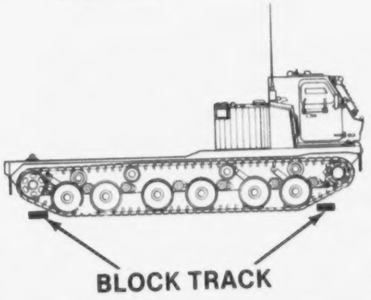
13. REMOVE TWO TRACK FIXTURES.
    a. Loosen two track fixtures. Use 1 3/8 inch open end wrench.
    b. Remove two track fixtures.

14. ADJUST TRACK TENSION. See page 3-40.


CROWBAR
DRIFT PIN
TRACK FIXTURE
REAR BUMPER

15. STOW DRIFT PIN, TWO TRACK FIXTURES, AND CROWBAR.
    a. Install drift pin, two track fixtures, and crowbar inside rear bumper.

16. REMOVE BLOCKS FROM TRACK.


BLOCK TRACK

END OF TASK

REMOVE/INSTALL TRACK

DESCRIPTION

This task covers: Remove (page 3-54). Install (page 3-55).

INITIAL SETUP

Tools:

Crowbar (Item 9, App B)

Personnel Required:

Driver
Helper (H) (2)

Equipment Conditions:

Engine stopped (page 2-167)
Track thrown or partially thrown

REMOVE

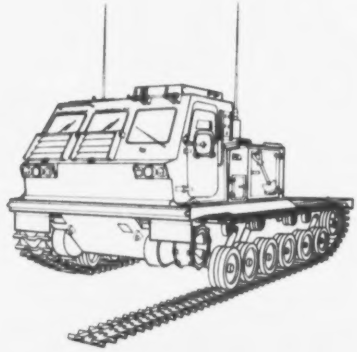
NOTE

This procedure tells how to remove/install left track from front of carrier. Procedure for removing/installing right track from front of carrier is the same. Track may also be removed and installed from rear of carrier.

1. BREAK TRACK. See task: BREAK/JOIN TRACK, page 3-45.

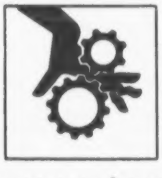
NOTE

The following steps will require two helpers. One helper will walk with track while carrier is driven backward or forward very slowly. The other helper will talk with the driver and assist first helper as needed.

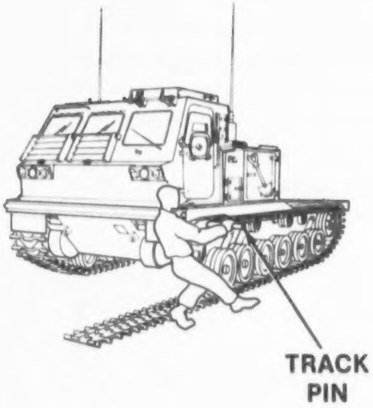


2. START ENGINE. See page 2-123.

WARNING



Hands could be crushed. Use caution when working near sprocket or track while engine is running. Always use crowbar and track pin to move track.



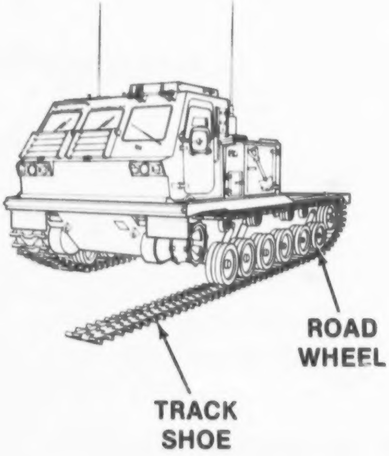
3. DRIVE CARRIER BACKWARD VERY SLOWLY UNTIL TRACK IS OFF SPROCKET. HAVE HELPER INSERT TRACK PIN AND HOLD BACK ON TRACK UNTIL TRACK IS ALL THE WAY OFF. See task: DRIVE CARRIER, page 2-158.

4. STOP ENGINE. See page 2-167.

INSTALL

NOTE

Carrier will pull (steer) to one side if track on that side is brand new and track on opposite side is used track. This condition is normal and should decrease after approximately 200 miles of operation.

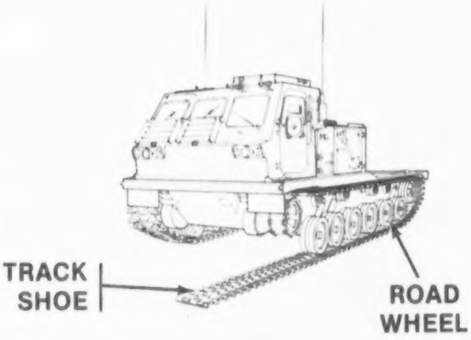


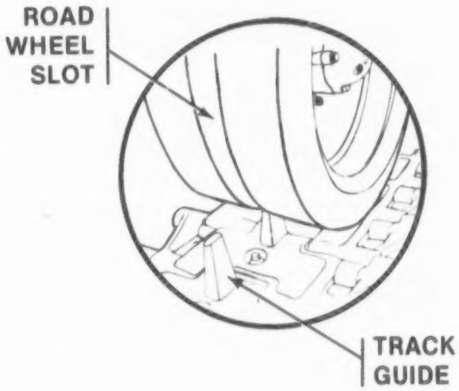
5. PLACE TRACK IN STRAIGHT LINE IN FRONT OF ROAD WHEELS.

6. START ENGINE. See page 2-123.

GO TO NEXT PAGE

7. CHECK THAT TRACK GUIDES ARE CENTERED IN THE ROAD WHEEL SLOTS. DRIVE CARRIER FORWARD VERY SLOWLY OVER TRACK UNTIL NINE TRACK SHOES ARE AHEAD OF FIRST ROAD WHEEL. See task: DRIVE CARRIER, page 2-158.


TRACK SHOE
ROAD WHEEL

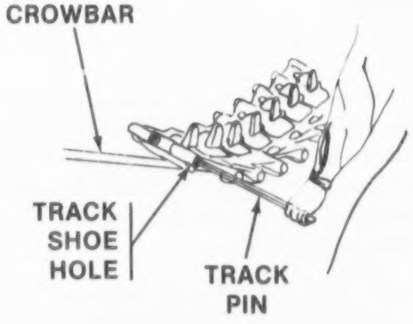

ROAD WHEEL SLOT
TRACK GUIDE

8. STOP ENGINE. See page 2-167.

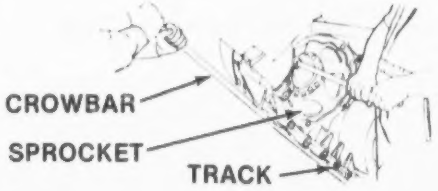
WARNING

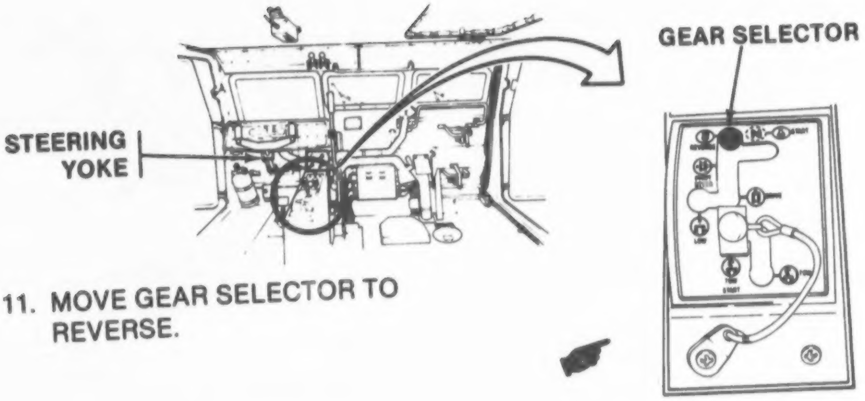
Hands could be crushed. Use caution when working near sprocket or track while engine is running. Always use crowbar and track pin to move track.

9. (H) (2) GUIDE TRACK OVER SPROCKET.
   a. (H-1) Insert track pin part way into first track shoe hole.
   b. (H-2) Lift track with crowbar and track pin, and place it on sprocket.
   c. (H-2) Use crowbar as lever against ground and track to hold track against sprocket.

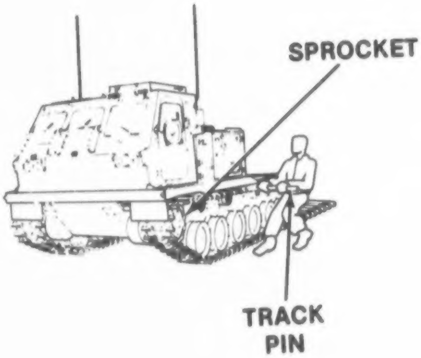

CROWBAR
TRACK SHOE HOLE
TRACK PIN

10. START ENGINE. See page 2-123.


CROWBAR
SPROCKET
TRACK


STEERING YOKE
GEAR SELECTOR

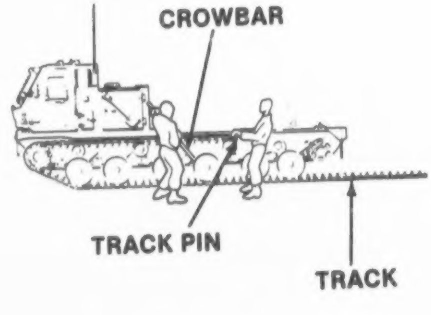
11. MOVE GEAR SELECTOR TO REVERSE.


SPROCKET
TRACK PIN

NOTE

If track slips sprocket, repeat step 12 to take up slack.

12. TURN STEERING YOKE LEFT TO TAKE UP SLACK ON LEFT TRACK. TURN STEERING YOKE RIGHT TO TAKE UP SLACK ON RIGHT TRACK.

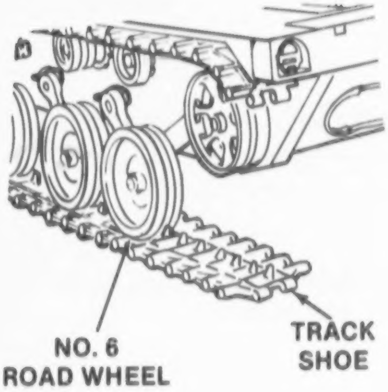

CROWBAR
TRACK PIN
TRACK

13. DRIVE CARRIER BACKWARD VERY SLOWLY UNTIL TRACK IS OVER SPROCKET. HAVE TWO HELPERS GUIDE TRACK TO SECOND DUAL SUPPORT ROLLER. See task: DRIVE CARRIER, page 2-158.
    a. (H-1) hold up track pin over second dual support roller.
    b. (H-2) position crowbar between road wheel and road wheel support arm.

GO TO NEXT PAGE

14. DRIVE CARRIER BACKWARD VERY SLOWLY WHILE (H-2) LIFTS TRACK WITH CROWBAR TO TAKE UP SLACK. (H-1) PULL ON TRACK WITH TRACK PIN TO TAKE UP SLACK. REPEAT STEP UNTIL TRACK SLACK IS TAKEN UP PAST SECOND DUAL SUPPORT ROLLER.

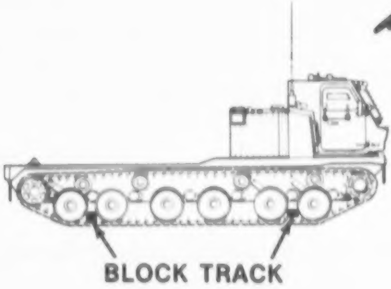
15. CONTINUE TO DRIVE CARRIER BACKWARD VERY SLOWLY UNTIL NO. 6 ROAD WHEEL IS ON THIRD TRACK SHOE.


NO. 6
ROAD WHEEL
TRACK
SHOE

16. STOP ENGINE. See page 2-167.

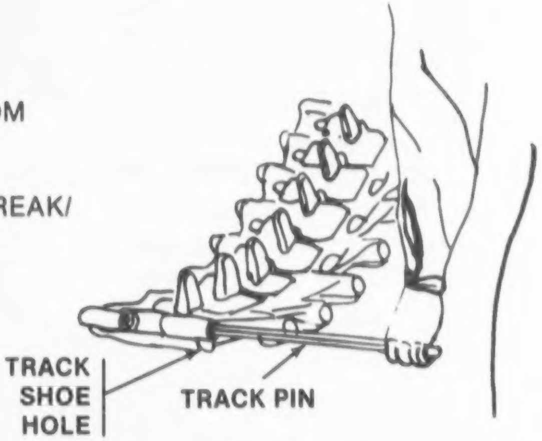
NOTE
Use suitable object to block track.

17. BLOCK TRACK SECURELY INSIDE ROAD WHEELS ON OPPOSITE SIDE OF CARRIER.


BLOCK TRACK

18. REMOVE TRACK PIN FROM TRACK SHOE HOLE.

19. JOIN TRACK. See task: BREAK/JOIN TRACK, page 3-45.


TRACK
SHOE
HOLE
TRACK PIN

END OF TASK

REMOVE/INSTALL TRACK SHOE

DESCRIPTION

This task covers: Remove (page 3-59). Install (page 3-63).

INITIAL SETUP

Tools:

Socket handle, 3/4 inch drive (Item 23, App B)
Socket handle, 1/2 inch drive (Item 24, App B)
Socket, 9/16 inch (Item 41, App B)
Socket, 15/16 inch (Item 46, App B)
Sledge hammer (Item 21, App B)
Hammer, 2 lb (Item 22, App B)
Drift pin (Item 12, App B)

Personnel Required:

Driver
Helper (H)

Equipment Conditions:

Carrier on level surface
Engine stopped (page 2-167)

REMOVE

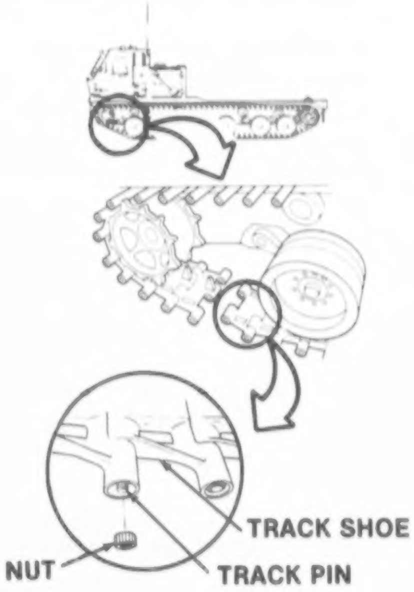
NOTE

This procedure tells how to replace track shoe in left track (front). Procedure to replace track shoe in right track (front) is the same.

1. BREAK TRACK TO REMOVE TRACK SHOE. See task: BREAK/JOIN TRACK, page 3-45.

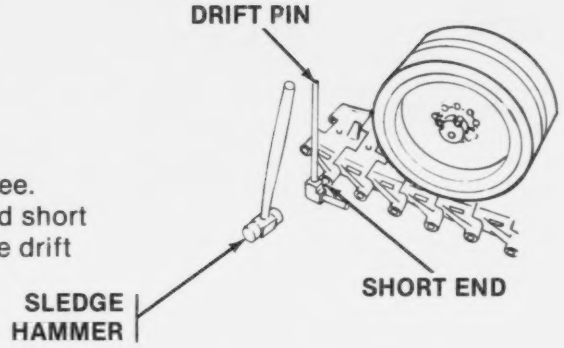
2. REMOVE TRACK SHOE FROM BROKEN TRACK. HAVE HELPER ASSIST.

   a. Remove nut from track pin of track shoe to be replaced. Use 3/4 inch drive socket handle and 15/16 inch socket.

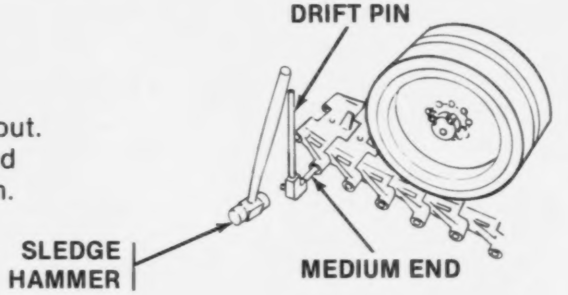


GO TO NEXT PAGE

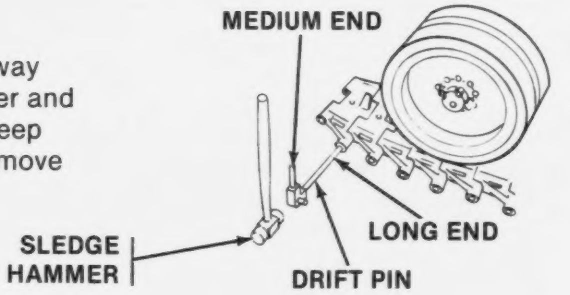
b. Drive track pin partly free. Use sledge hammer and short end of drift pin. Remove drift pin.


DRIFT PIN
SLEDGE HAMMER
SHORT END

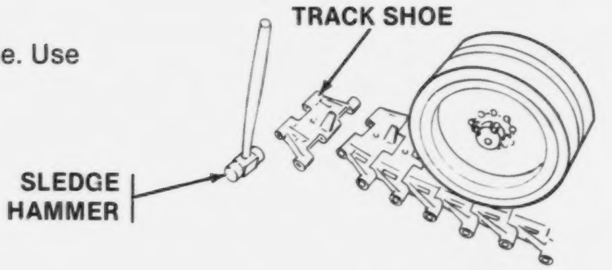
c. Drive track pin farther out. Use sledge hammer and medium end of drift pin. Remove drift pin.


DRIFT PIN
SLEDGE HAMMER
MEDIUM END

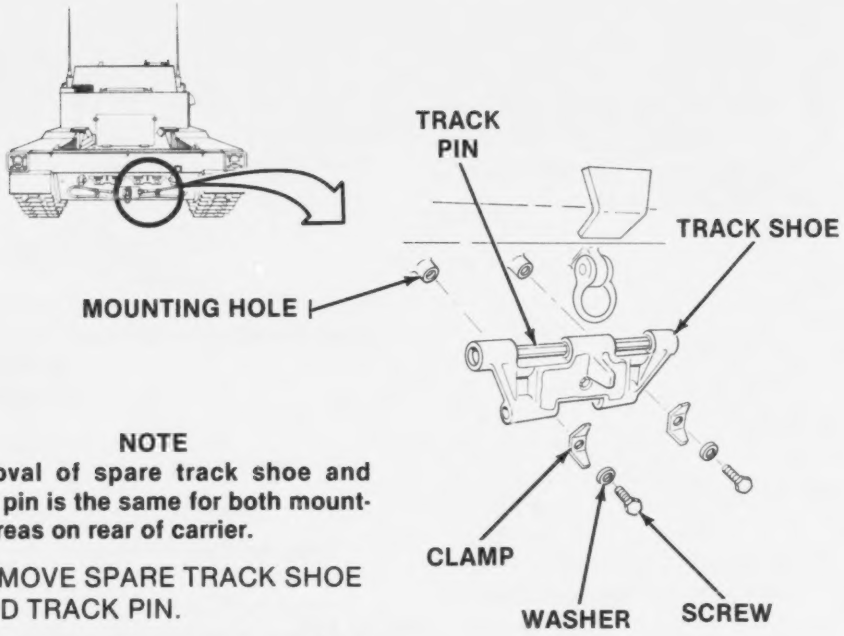
d. Drive track pin all the way out. Use sledge hammer and long end of drift pin. Keep medium end up and remove drift pin.


MEDIUM END
SLEDGE HAMMER
LONG END
DRIFT PIN

e. Tap track shoe loose. Use sledge hammer.


TRACK SHOE
SLEDGE HAMMER

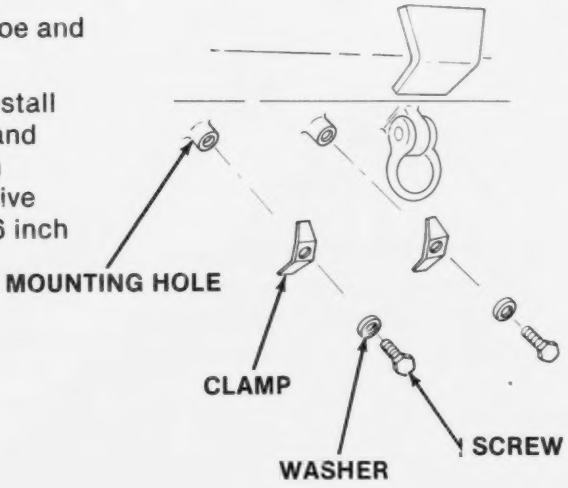
best copy available


TRACK PIN
TRACK SHOE
MOUNTING HOLE
CLAMP
WASHER
SCREW

NOTE

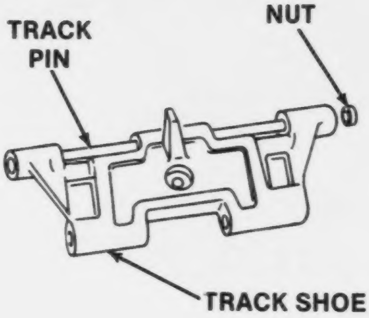
Removal of spare track shoe and track pin is the same for both mounting areas on rear of carrier.

3. REMOVE SPARE TRACK SHOE AND TRACK PIN.
   a. Remove two screws, washers, and clamps from hull. Use 1/2 inch drive socket wrench and 9/16 inch socket.
   b. Remove spare track shoe and track pin.
   c. Reverse two clamps. Install two clamps, washers, and screws on hull. Tighten screws. Use 1/2 inch drive socket wrench and 9/16 inch socket.

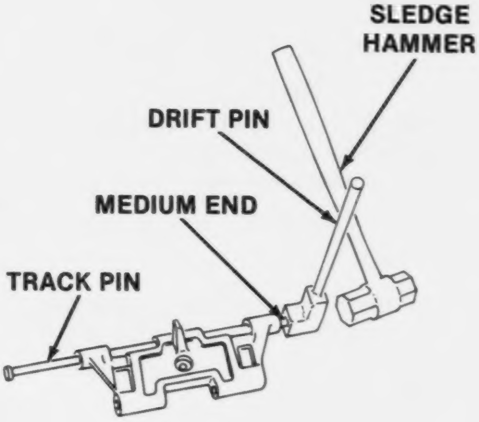

MOUNTING HOLE
CLAMP
WASHER
SCREW

GO TO NEXT PAGE

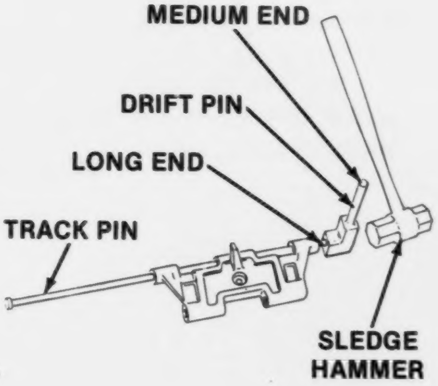
d. Remove nut from track pin on spare track shoe. Use 3/4 inch drive socket bar handle and 15/16 inch socket.


TRACK PIN
NUT
TRACK SHOE

e. Drive track pin partly free. Use sledge hammer and medium end of drift pin. Remove drift pin.

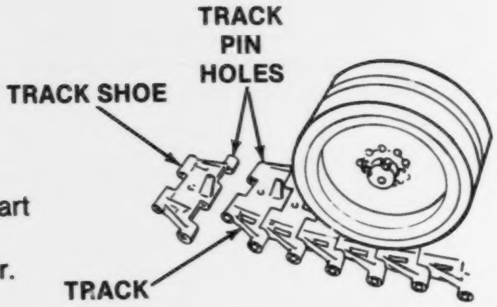

SLEDGE HAMMER
DRIFT PIN
MEDIUM END
TRACK PIN

f. Drive track pin all the way out. Use sledge hammer and long end of drift pin. Keep medium end up and remove drift pin.


MEDIUM END
DRIFT PIN
LONG END
TRACK PIN
SLEDGE HAMMER

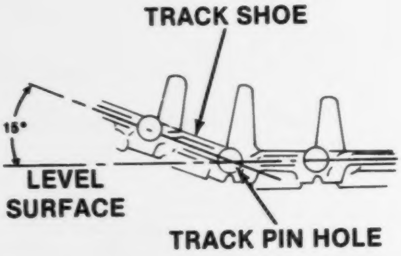
INSTALL

4. INSTALL TRACK SHOE ON BROKEN TRACK.
   a. Place track shoe in lower part of track. Aline track pin holes. Use 2 pound hammer.

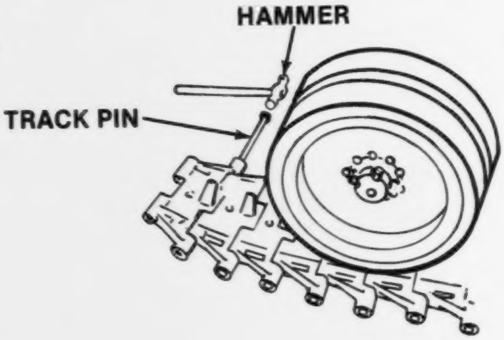

TRACK
PIN
HOLES
TRACK SHOE
TRACK

NOTE

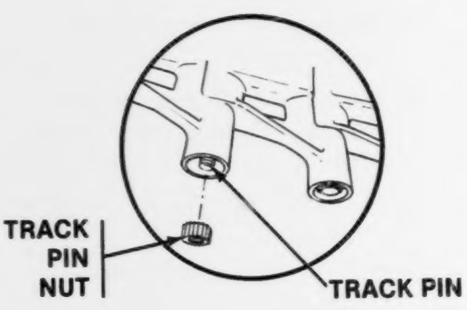
One track pin nut must be on track pin with one thread showing before installation.


TRACK SHOE
15°
LEVEL
SURFACE
TRACK PIN HOLE

   b. Adjust track shoe with hammer to get 15 degree offset of track shoe. From inside of track, drive track pin with one track pin nut into track pin hole. Use 2 pound hammer.


HAMMER
TRACK PIN

   c. Install track pin nut on track pin. Use 3/4 inch drive socket bar handle and 15/16 inch socket.
   d. Mark track pin nut for torquing by organizational maintenance.
5. JOIN TRACK. See task: BREAK/JOIN TRACK, page 3-45.

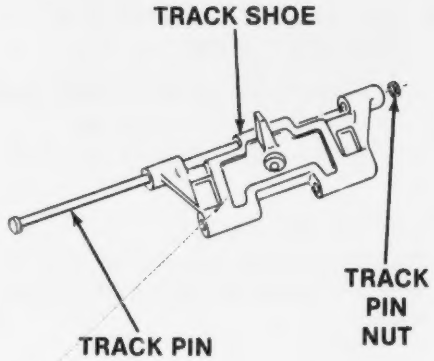

TRACK
PIN
NUT
TRACK PIN

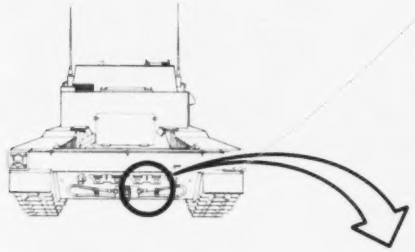
GO TO NEXT PAGE

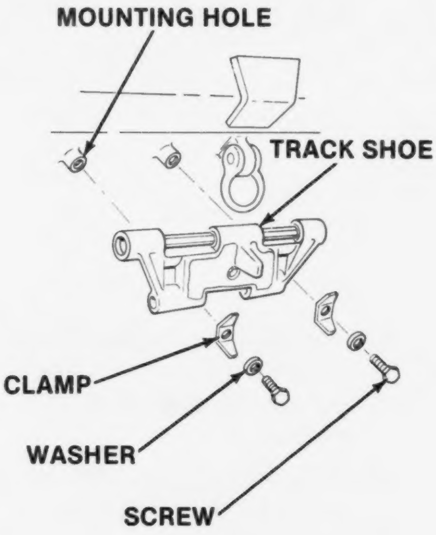
NOTE

The following procedure is the same for both mounting areas on rear of carrier.

6. STOW SPARE TRACK SHOE AND TRACK PIN.
   a. Tap track pin into track shoe. Use two pound hammer.
   b. Install track pin nut on track pin. Use 3/4 inch drive socket handle and 15/16 inch socket.


TRACK SHOE
TRACK PIN
TRACK PIN NUT




MOUNTING HOLE
TRACK SHOE
CLAMP
WASHER
SCREW

   c. Remove two screws, washers, and clamps from hull. Use 1/2 inch drive ratchet and 9/16 inch socket.
   d. Put track shoe over mounting holes.
   e. Reverse and install two clamps.
   f. Install two washers and screws. Tighten two screws. Use 1/2 inch drive ratchet and 9/16 inch socket.

END OF TASK

REMOVE/INSTALL TRACK SHOE PADS

DESCRIPTION

This task covers: Remove (page 3-65). Install (page 3-67).

INITIAL SETUP

Tools:

Socket wrench handle, 3/4 inch drive (Item 23, App B)
Socket, 15/16 inch (Item 46, App B)
Hammer, 2 lb (Item 22, App B)

Personnel Required:

Driver
Helper (H)

Equipment Conditions:

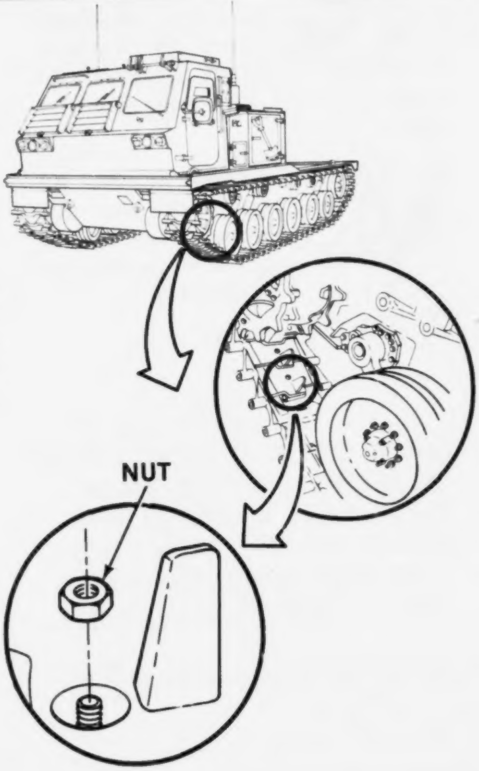
Engine stopped (page 2-167)

REMOVE

NOTE

Grousers wear out quickly without track shoe pads. Do not drive on pavement without pads. Remove pads only to drive on mud, snow, or ice.

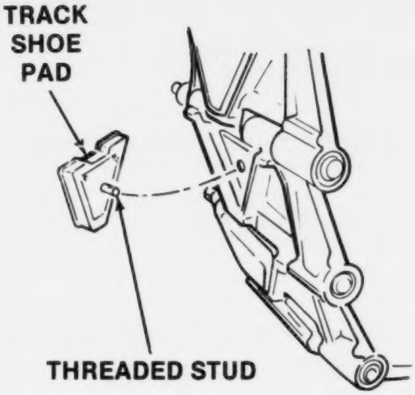
Track shoe pads should be removed from track shoes between drive sprocket and first road wheel or between idler wheel and sixth road wheel.



1. REMOVE ALL TRACK SHOE PADS YOU CAN REACH.
   a. Remove nut. Use 3/4 inch socket wrench handle and 15/16 inch socket.

GO TO NEXT PAGE

b. Tap on threaded stud and remove track shoe pad. Use hammer.



2. START ENGINE. See page 2-123.

WARNING

Carrier tracks without track shoe pads can slide on hard surface. Soldiers could be injured. Allow plenty of room for stops, and slow down for turns.

Hands could be crushed. Do not work on track shoe pads while engine is running.

3. DRIVE CARRIER VERY SLOWLY TO BRING UP MORE TRACK SHOE PADS. HAVE HELPER SIGNAL WHEN TRACK SHOES ARE POSITIONED. See task: DRIVE CARRIER, page 2-158.

4. STOP ENGINE. See page 2-167.

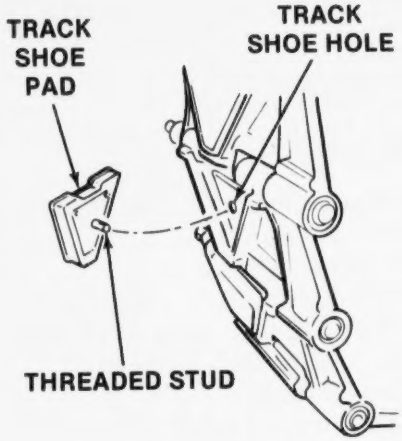
INSTALL

NOTE

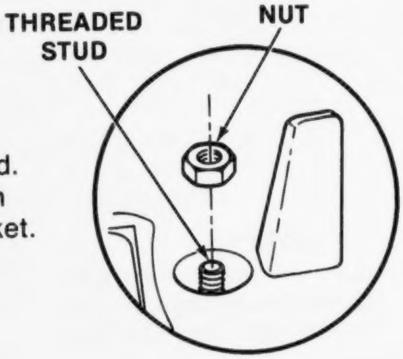
Back of track shoe pad and cavity of track where track shoe pad fits must be cleaned before installation.

Track shoe pads can be installed in track shoes between drive sprocket and first road wheel, or between idler wheel and sixth road wheel.

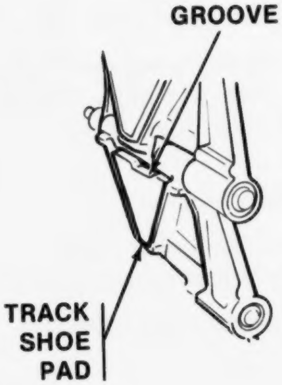
5. INSTALL ALL TRACK SHOE PADS YOU CAN REACH.
   a. Put threaded stud through track shoe hole from under track.


TRACK
SHOE
PAD
TRACK
SHOE HOLE
THREADED STUD

   b. Install nut on threaded stud. Use 3/4 inch socket wrench handle and 15/16 inch socket.


THREADED
STUD
NUT

   c. Check that track shoe pad is fully seated in groove.


GROOVE
TRACK
SHOE
PAD

6. MARK ALL TRACK SHOE PADS THAT HAVE BEEN REPLACED. NOTIFY ORGANIZATIONAL MAINTENANCE TO INSTALL AND TORQUE NEW NUTS.

END OF TASK

REPLACE TRACK ADJUSTER LUBRICATION FITTING

INITIAL SETUP

Tools:

- Socket wrench, 1/2 inch drive (Item 24, App B)
- Socket, 7/16 inch (Item 39, App B)
- Socket, 5/8 inch (Item 42, App B)
- Open end wrench, 5/8 inch (Item 52, App B)
- Socket, extension, 5 inch (Item 14, App B)

Materials/Parts:

- Wiping rag (Item 11, App D)
- Lubrication fitting — MS 15003-1

Personnel Required:

- Driver
- Crew

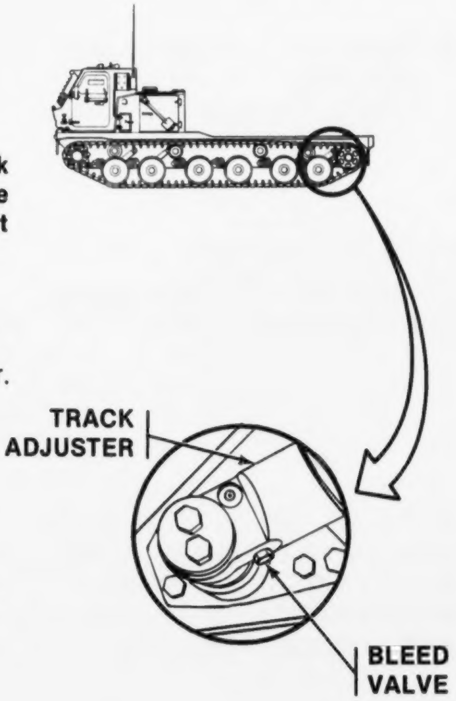
Equipment Conditions:

- Engine stopped (page 2-167)

NOTE

The procedure for replacing track adjuster lubrication fittings is the same for right and left sides. The left side is shown.

1. RELEASE TRACK TENSION.
   a. Loosen, but do not remove bleed valve on track adjuster. Use 5/8 inch open end wrench.
   b. Let grease flow out.
   c. Tighten bleed valve. Use 5/8 inch open end wrench.
   d. Wipe away grease. Use wiping rag.



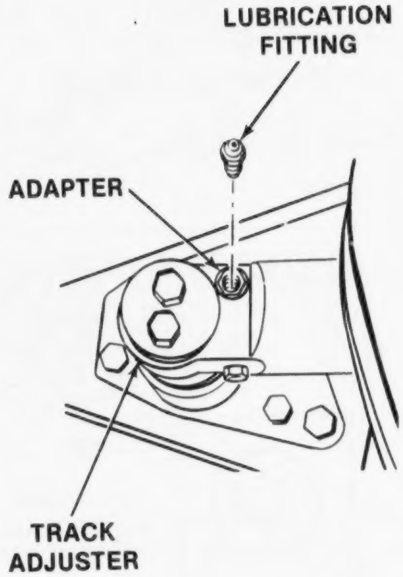
GO TO NEXT PAGE

2. CHECK ADAPTER.
   a. If adapter is loose, tighten it. Use 1/2 inch drive socket wrench, 5/8 inch socket, and 5 inch socket extension.

3. REMOVE LUBRICATION FITTING FROM TRACK ADJUSTER.
   a. Wipe dirt or sand from lubrication fitting. Use wiping rag.
   b. Unscrew lubrication fitting from track adjuster. Use 1/2 inch drive socket wrench, 7/16 inch socket, and 5 inch socket extension.

4. INSTALL NEW LUBRICATION FITTING ON TRACK ADJUSTER.
   a. Install lubrication fitting on track adjuster.
   b. Tighten lubrication fitting. Use 1/2 inch drive socket wrench, 7/16 inch socket, and 5 inch socket extension.

5. ADJUST TRACK TENSION. See page 3-40.



END OF TASK

CHECK/FILL RADIATOR

INITIAL SETUP

Materials/Parts:

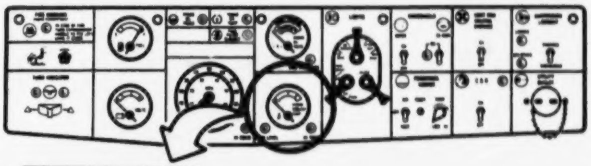
Antifreeze (Item 1, App D)

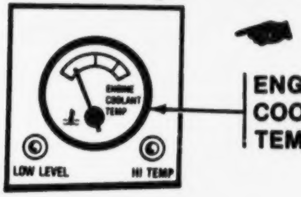
Personnel Required:

Driver

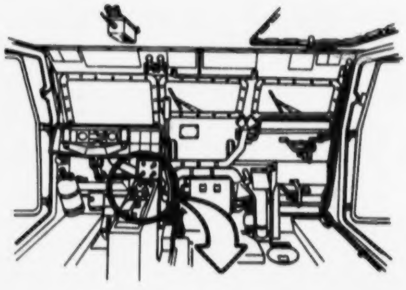
Equipment Conditions:

Engine stopped (page 2-167)




ENGINE
COOLANT
TEMP
LOW LEVEL
HI TEMP

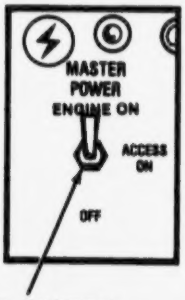
ENGINE COOLANT TEMP GAGE



WARNING

Hot coolant can burn you:

- **Do not open radiator cap access cover or remove cap until coolant gage reads in bottom one-quarter of green zone.**
- **Use hand only to remove cap. Turn cap slowly to release pressure.**
- **Replace cap by pressing down and turning cap until tight. Use hand only.**


MASTER
POWER
ENGINE ON
ACCESS
ON
OFF

MASTER POWER SWITCH

1. CHECK COOLANT TEMPERATURE.
   a. Turn MASTER SWITCH to ENGINE ON.
   b. Read COOLANT TEMP gage.

2. OPEN RADIATOR COVER.
   a. Pull out latch pin, and open radiator cover.
   b. Release latch pin.

3. REMOVE RADIATOR CAP.
   a. Press down radiator cap to first notch and unscrew to release pressure.
   b. Press down, unscrew, and remove radiator cap.

NOTE

Some carriers may not have ADD and FULL markers. If your carrier does not have this marker, fill radiator to bottom of radiator filler neck.

4. CHECK COOLANT LEVEL.
   a. Look into radiator filler neck. If coolant level is below ADD marker, go to step 5. If coolant level is above ADD marker, go to step 6.

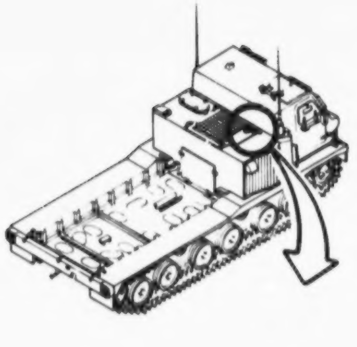
NOTE

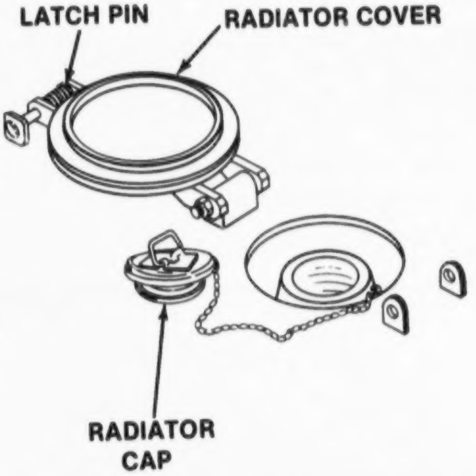
Approved antifreeze coolant only may be added to radiator. In an emergency, water may be added if specified coolant is not available.

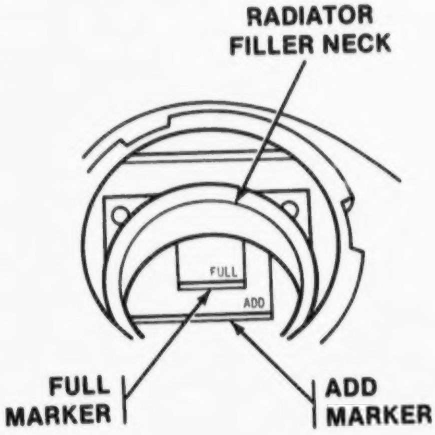
NOTE

Coolant other than the approved antifreeze added in an emergency should be drained and replaced with approved antifreeze at the earliest opportunity.

5. FILL RADIATOR.
   a. Pour coolant into radiator filler neck until coolant level reaches FULL marker.







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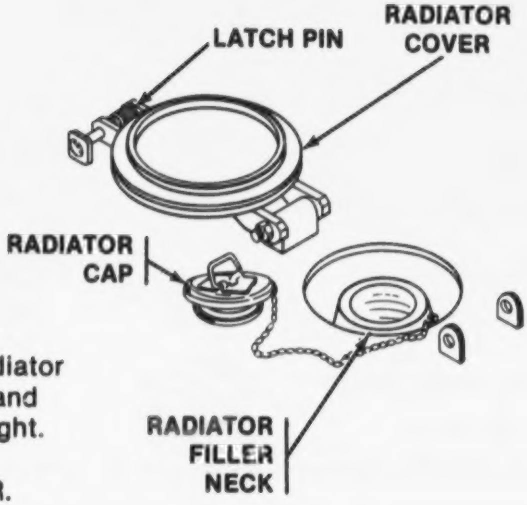

LATCH PIN
RADIATOR COVER
RADIATOR CAP
RADIATOR FILLER NECK

■ 6. INSTALL RADIATOR CAP.

   a. Put radiator cap into radiator filler neck. Press down and screw radiator cap on tight.

■ 7. CLOSE RADIATOR COVER.

   a. Pull out latch pin, and close radiator cover.

   b. Release latch pin.

END OF TASK

CHECK CARRIER BATTERIES

INITIAL SETUP

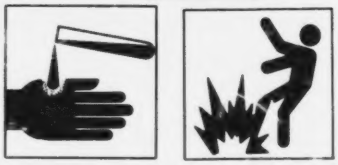
Tools:	References:
Flashlight (Item 20, App B)	TM 9-6140-200-14
Materials/Parts:	Equipment Conditions:
Wiping rag (Item 11, App D)	Engine stopped (page 2-167)
Personnel Required:	
Driver	

WARNING

Battery posts and cables touched by metal objects can short circuit and burn you or injure you. Use caution when you work with tools or other metal objects. Do not wear jewelry when you work on electrical system.

1. RAISE CAB. See task: RAISE/LOWER CAB, page 2-194.

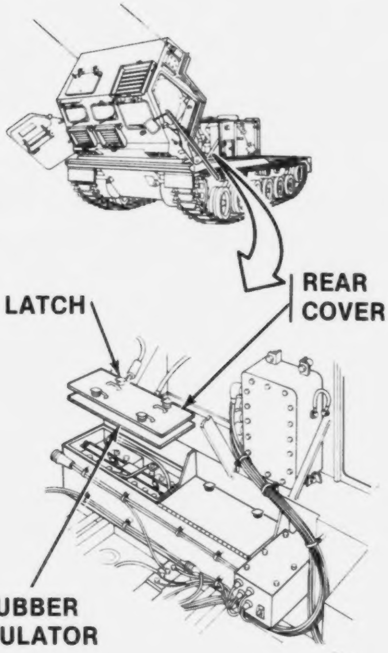
WARNING



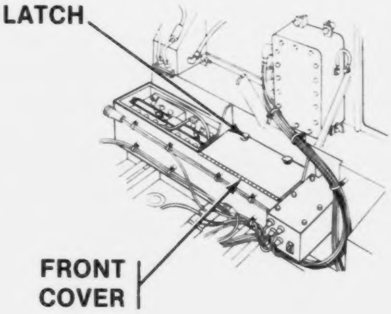
Gas from batteries can explode and injure you. Do not smoke or allow open flame near batteries. Battery acid can blind or burn you. Do not get acid on your skin or eyes.

NOTE

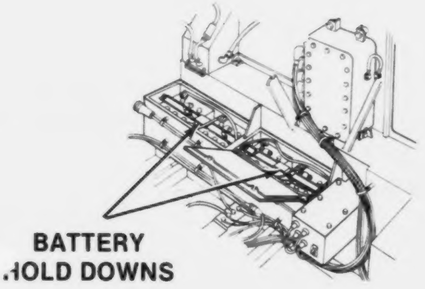
If batteries are missing, notify organizational maintenance.


LATCH
REAR COVER
RUBBER INSULATOR

2. REMOVE REAR COVER AND RUBBER INSULATOR.
   a. Push down and turn four latches on rear cover.
   b. Remove rear cover and rubber insulator.


LATCH
FRONT COVER

3. OPEN FRONT COVER.
   a. Push down and turn two latches on front cover.
   b. Open front cover.

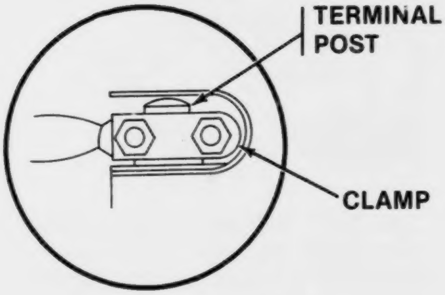

BATTERY HOLD DOWNS

4. CHECK BATTERY HOLD DOWNS.
   a. Hold each battery hold down with both hands and try to move it.
   b. If batteries move or seem loose, notify organizational maintenance.

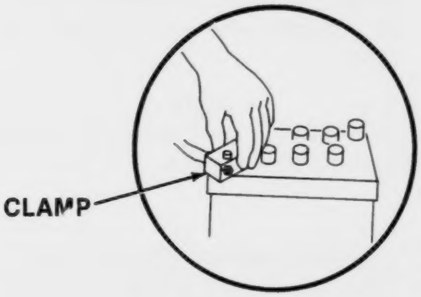
GO TO NEXT PAGE

5. CHECK BATTERY CONNECTIONS.

   a. Check that each clamp is all the way down on terminal post.

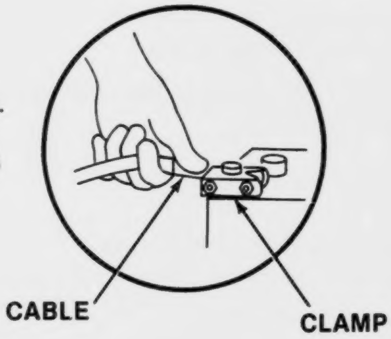

TERMINAL POST
CLAMP

   b. Try to twist each clamp with thumb and first two fingers.



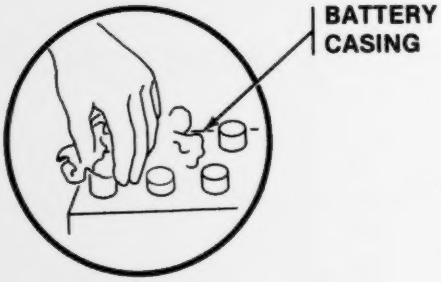
   c. Check to see if cables are securely connected to clamp.

   d. If any clamp or connection is loose, notify organizational maintenance.

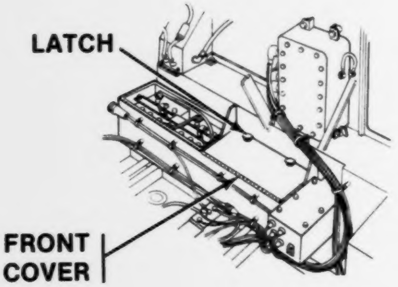

CABLE
CLAMP

6. CHECK BATTERY ELECTROLYTE LEVEL. See TM 9-6140-200-14.

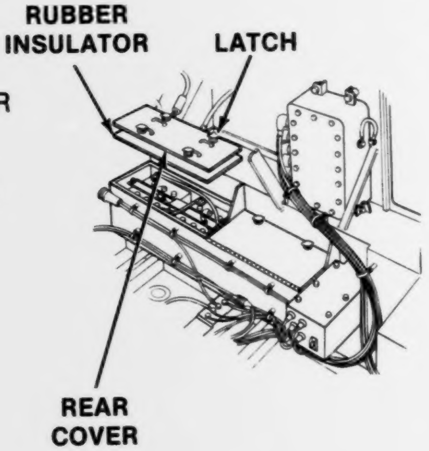
7. CLEAN BATTERY.
   a. Wipe off battery casing and surrounding metal parts. Use clean dry wiping rag.
   b. If wiping rag will not remove dirt, notify organizational maintenance.


BATTERY CASING

8. CLOSE FRONT COVER.
   a. Close front cover.
   b. Push down and turn two latches on front cover.


LATCH
FRONT COVER

9. INSTALL RUBBER INSULATOR AND REAR COVER.
   a. Install rubber insulator and rear cover.
   b. Push down and turn four latches on rear cover.


RUBBER INSULATOR
LATCH
REAR COVER

10. LOWER CAB. See task: RAISE/LOWER CAB, page 2-194.

END OF TASK

CHAPTER 4

MAINTENANCE OF AUXILIARY EQUIPMENT

SCOPE

This chapter tells you where to find maintenance instructions for auxiliary equipment.

M16A1 RIFLE
See TM 9-1005-249-10.

40MM GRENADE LAUNCHER, M203
See TM 9-1010-221-10.

M8 ALARM (CHEMICAL AGENT)
See TM 3-6665-225-12.

DS2 DECONTAMINATING APPARATUS
See TM 3-4230-204-12&P.

DETECTOR KIT, CHEMICAL AGENT, M2SG
See TM 3-6665-307-10.

RADIO SET AN/URC-47
See TM 11-5820-401-10-LD-6.

BINOCULARS W/E
See TM 9-1240-372-100

APPENDIX A
REFERENCES

SCOPE

This appendix lists all forms, field manuals, and technical manuals referenced in this manual and which apply to operating the MLRS carrier.

PUBLICATION INDEX

The following index should be consulted often. Check this index for the latest changes or revisions to references given in this appendix. Check this index for new publications relating to material covered in this technical manual.

Consolidated Index of Army Publications and Blank Forms	DA Pamphlet 310-1
The Army Maintenance Management Systems (TAMMS)	DA Pamphlet 738-750

FORMS

Equipment Inspection and Maintenance Work Sheet	DA Form 2404
Organizational Control Record for Equipment	DA Form 2401
Quality Deficiency Report, Category 2	SF 368
Recommended Changes to Equipment Technical Publications	DA Form 2028-2

LUBRICATION

Lubrication Order for Multiple Launch Rocket System (2350-01-091-5405)	LO 9-1450-646-12

FIELD MANUALS

Basic Cold Weather Manual	FM 31-70
First Aid for Soldiers	FM 21-11
How to Fight Mountain Operations	FM 90-6
Manual for Tracked Combat Vehicle Driver	FM 21-306
Northern Operations	FM 31-71

TECHNICAL MANUALS

Ammunition and Explosives Standards	TM 9-1300-206
Destruction of Conventional Ammunition and Improved Conventional Munitions to Prevent Enemy Use (Excluding Toxic and Incapacitation Chemical Agents) (For Combat Units)	TM 750-244-5-1
Direct Support Maintenance Manual (Including Repair Parts and Special Tools List): Purifier, Air: M2A1 (4240-00-307-7805), Purifier, Air: M2A2 (4240-00-868-7906), and Precleaner and Particulate Filter Assembly: M1A1 (4240-01-02603112)	TM 3-4340-276-30&P
General Ammunition	TM 9-1300-200
Operator's and Organizational Maintenance Manual: Alarm, Chemical Agent, Automatic; Portable, Manpack, M8 (6665-00-935-6955); Fixed Emplacement, M-10 (6665-00-169-1446) for Trucks, Utility: 1/4-Ton, M-11 (6665-00-169-1447); Truck: 3/4-Ton, M-12 (6665-00-169-1448); Truck: 2 1/2-Ton, M-13 (6665-00-169-1449); Full-tracked, Armored Personnel Carriers and Recovery Vehicles, M-14 (6665-00-169-1450); Carrier, Command, and Reconnaissance, Armored: M-15 (6665-00-169-1451); with Power Supply for Truck, Utility: 1/4-Ton, M-16 (6665-00-169-1452); Truck, 3/4-Ton, M-17 (6665-00-169-1453); and Truck: 2 1/2-Ton, M-18 (6665-00-169-1454)	TM 3-6665-225-12
Operator's Manual: Binoculars, W/E: M3 (1240-00-670-2491), M7 (1240-00-620-2500), M13 (1240-00-670-2508), M13A1 (1240-00-530-0973), M15A1 (1240-00-530-0959), M16 (1240-00-670-2514), M17A1 (1240-00-530-0974)	TM 9-1240-372-10

Operator's and Organizational Maintenance Manual: Detector Kit, Chemical Agent, VGH, AN-M15A2A	TM 3-6665-253-12
Operator's Manual: Detector Kit, Chemical Agent: M256 (6665-01-016-8399)	TM 3-6665-307-10
Operator's Manual, Radio Sets AN/VRC-12 (5820-00-223-7412), AN/VRC-43 (5820-00-223-7415), AN/VRC-44 (5820-00-223-7417), AN/VRC-45 (5820-00-223-7418), AN/VRC-46 (5820-22-223-7433), AN/VRC-47 (5820-00-223-7434), AN/VRC-48 (5820-00-223-7436), AN/VRC-49 (5820-00-223-7437) (Used without intercom system). (Navelex EE 150-JA-OP1-010/E154)	TM 11-5820-401-10-1
Communications Security Equipment TSEC/KY-57, Volume 3: Installation Kits for Track Vehicles	TM 11-5810-312-12-3
Operator's and Organizational Maintenance Manual (including Repair Parts and Special Tools List) for Decontaminating Apparatus, Portable, DS2, 1 1/2 Quart, ABC-M11	TM 3-4230-204-12&P
Operator's Manual: M16A1 Rifle	TM 9-1005-249-10
Operation and Maintenance of Ordnance Materiel: In Cold Weather (0° to -65°F)	FM 9-207
Operator's Manual for Viewers, Driver's Night Vision	TM 11-5855-249-10
Operator's, Organizational, Direct Support, and General Support Maintenance (Including Repair Parts and Special Tools List); MC-193A Storage Battery	TM 9-6140-200-14

TECHNICAL MANUALS (cont)

Plastic-Laminated Condensed Operating Instructions for Radio Set AN/VRC-47 (5820-00-223-7434)	TM 11-5820-401-10-LD-6
Procedures for Destruction of Electronics Materiel to Prevent Enemy Use	TM 750-244-2
Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Use	TM 750-244-6

OTHER PUBLICATIONS

Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items	CTA 50-970

APPENDIX B
COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LISTS

Section I. INTRODUCTION

SCOPE

This appendix lists components of end item and basic issue items for the MLRS carrier to help you inventory items required for safe and efficient operation.

GENERAL

The Components of End Item and Basic Issue Items Lists are divided into the following sections:

a.*Section II.* Components of End Item. This listing is for informational purposes only, and is not authority to requisition replacements. These items are part of the end item, but are removed and separately packaged for transportation or shipment. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Illustrations are furnished to assist you in identifying the items.

b.*Section III.* Basic Issue Items. These are the minimum essential items required to place the MLRS carrier in operation, to operate it, and to perform emergency repairs. Although shipped separately, packaged BII must be with the MLRS carrier during operation and whenever it is transferred between property accounts. The illustrations will assist you with hard-to-identify items. This manual is your authority to request/requisition replacement BII, based on TOE/MTOE authorization.

EXPLANATION OF COLUMNS

The following provides an explanation of columns found in the tabular listings:

a.*Column (1)* — Illustration Number (Illus. No.). This column indicates the number of the illustration in which the item is shown.

Section I. INTRODUCTION (cont)

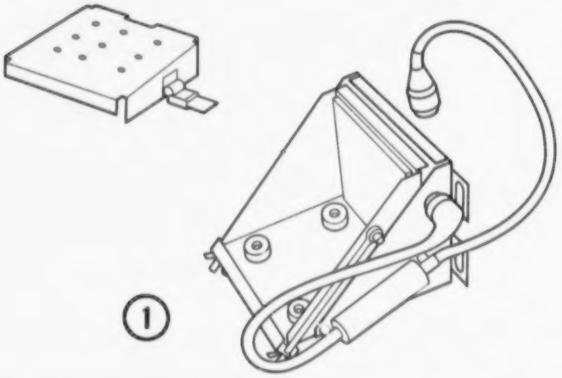
b.*Column (2)* — National Stock Number. Indicates the National stock number assigned to the item and will be used for requisitioning purposes.

c.*Column (3)* — Description. Indicates the National item name and, if required, a minimum description to identify and locate the item. The last line for each item indicates the FSCM (in parentheses) followed by the part number.

d.*Column (4)* — Unit of Measure (U/M). Indicates the measure used in performing the actual operational/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr).

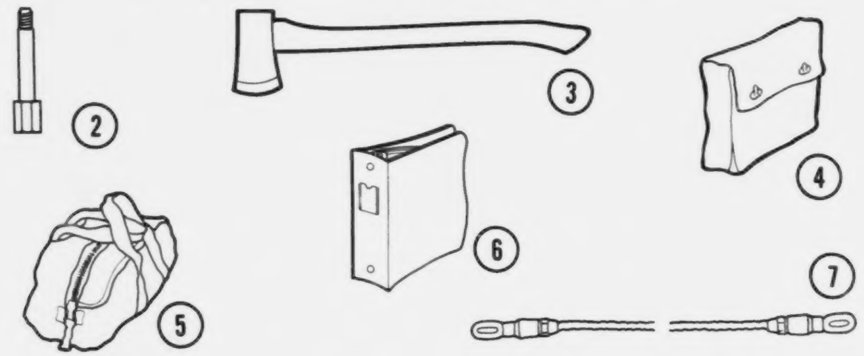
e.*Column (5)* — Quantity Required (Qty Rqr). Indicates the quantity of the item authorized to be used with/on the equipment.

Section II. COMPONENTS OF END ITEM



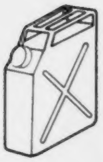
(1) ILLUS. NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	(4) U/M	(5) QTY RQR
NI	5820-01-061-8971	INSTALLATION HARNESS: ELECTRONIC EQUIPMENT (AN/VRC RADIO) WITH ONE AM-1780/VRC AND THREE C-2298/VRC (INSIDE CAB) (80063) PPL-5250	EA	1
1	6665-00-110-9492	KIT, MOUNTING, M182 (FOR M43 DETECTOR) (LEFT EXTERIOR SIDE OF CAB) (81361) E5-15-5300	EA	1

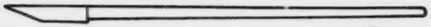
Section III. BASIC ISSUE ITEMS

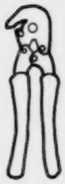


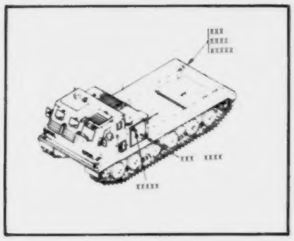
(1) ILLUS. NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	(4) U/M	(5) QTY RQR
2	4930-00-204-2550	ADAPTER, GREASE GUN, THIN STEM, SLEEVE TYPE (TOOL BAG) (19207) 5349744	EA	1
3	6110-00-293-2336	AX, SINGLE BIT, CHOPPING, 4 LB. (INSIDE REAR BUMPER) (19207) 6150925	EA	1
4	2540-00-670-2459	BAG, ASSEMBLY PAMPHLET (WALL FORWARD OF GUNNER) (19207) 11676920	EA	1
5	5140-00-473-6256	BAG, ASSEMBLY TOOL EMPTY (IN ENGINE COMPARTMENT) (19207) 11655979	EA	1
6	7510-00-889-3494	BINDER: LOOSE LEAF, THREE RING FOR EQUIPMENT LOG BOOK (PAMPHLET BAG) (19207) 11677003	EA	1
7	4010-00-767-3149	CABLE, TOW STEEL (EXTERIOR REAR) (19207) 10861718	EA	1

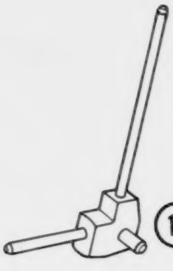
BASIC ISSUE ITEMS (cont)

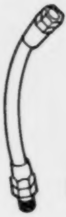




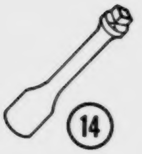


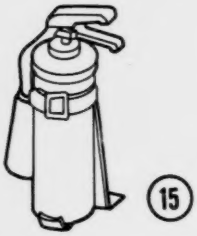


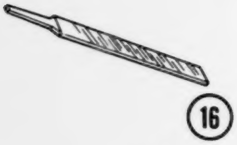


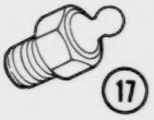


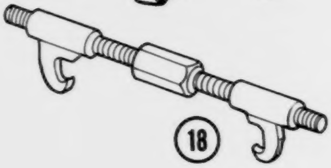
(1) ILLUS. NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	(4) U/M	(5) QTY RQR
8	7240-00-242-6153	CAN, WATER 5 GALLON (BEHIND DRIVER'S SEAT) (19207) 11655980	EA	2
9	5120-00-224-1390	CROWBAR: PINCH POINT, 1 IN. WIDE, 5 FT. LONG (INSIDE REAR BUMPER) (19207) 11677049-1	EA	1
10	5110-00-595-8229	CUTTER: WIRE M1938 (TOOL BAG) (19207) 11655981	EA	1
11		DIAGRAM, STRAP LOCATION (PAMPHLET BAG) (19207) 12298995	EA	1
12	2530-01-075-8292	DRIFT PIN, TRACK (INSIDE REAR BUMPER) (53711) 2590157	EA	1
13	4930-00-288-1511	EXTENSION: GREASE GUN, FLEX, 12 IN. LONG (TOOL BAG) (19207) 6300333	EA	1

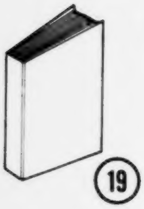






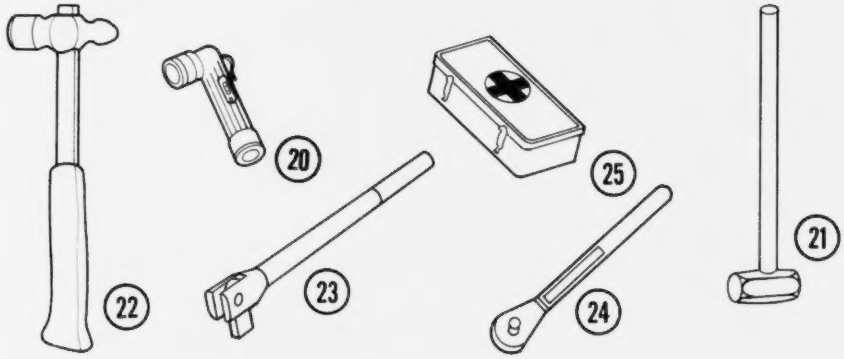




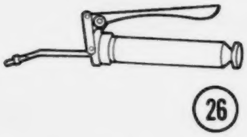


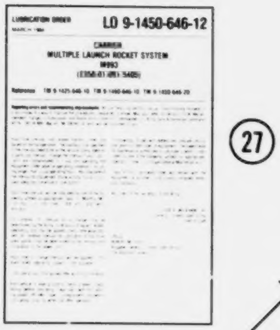
(1) ILLUS. NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	(4) U/M	(5) QTY RQR
14	5120-00-243-7326	EXTENSION, SOCKET WRENCH, 1/2 IN. SQ DR, 5 IN. LONG (TOOL BAG) (55719) SX5	EA	1
15	4210-00-555-8837	EXTINGUISHER, FIRE VAPORIZATION LIQUID (RIGHT SIDE OF DRIVER'S FEET) (18876) 10596569-1	EA	1
16	5120-00-156-0059	FILE, HAND SMOOTH, 10 IN. LONG (TOOL BAG) (19207) 41F1030	EA	1
17	4730-00-050-4208	FITTING, LUBRICATION, STRAIGHT (TOOL BAG) (96906) MS 15003-1	EA	6
18	5120-00-708-3799	FIXTURE, TRACK CONNECTING (INSIDE REAR BUMPER) (19207) 7083799	EA	2
19	DA FORM 2408	FORMS, EQUIPMENT RECORD FOLDER (BINDER, LOOSE LEAF)	EA	1

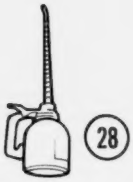
BASIC ISSUE ITEMS (cont)

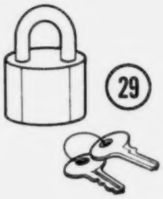


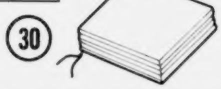
(1) ILLUS. NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	(4) U/M	(5) QTY RQR
20	6230-00-264-8261	FLASHLIGHT, ELECT HAND, 2 CELL W/LAMP (INSIDE CAB) (88063) MX991/U	EA	3
21	5120-00-243-2957	HAMMER, HAND, SLEDGE, DBL FACE, 10 LB. (INSIDE REAR BUMPER) (79416) 75H	EA	1
22	5120-00-061-8546	HAMMER, HAND, MACHINIST, BALL PEEN 2 LB. (TOOL BAG) (19207) 11677028-3	EA	1
23	5120-00-221-7959	HANDLE, SOCKET WRENCH, 3/4 IN. DRIVE, 20 1/2 IN LONG (TOOL BAG) (45225) AH377	EA	1
24	5120-00-230-6385	HANDLE, SOCKET WRENCH, RATCHET 1/2 IN. DRIVE, 15 1/2 IN. LONG (TOOL BAG) (55719) 71-15	EA	1
25	6545-00-922-1200	KIT, FIRST AID, MOTOR VEHICLE, 12 UNIT (RIGID CASE) (WALL IN FRONT OF COMMANDER) (19207) 11677011.	EA	1

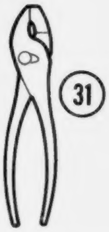






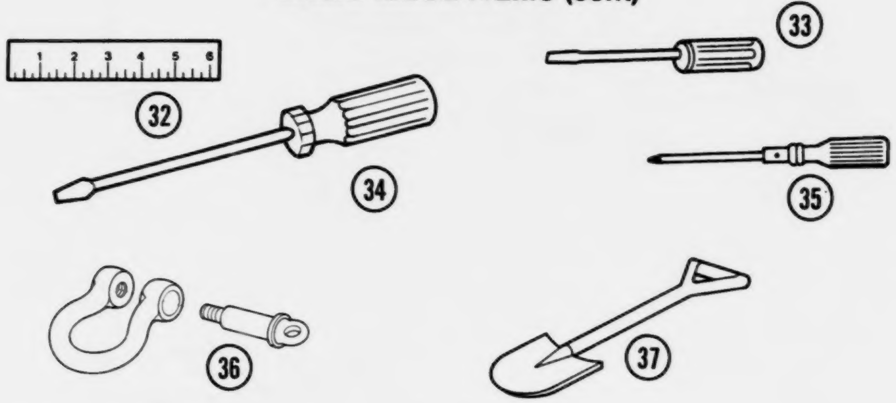




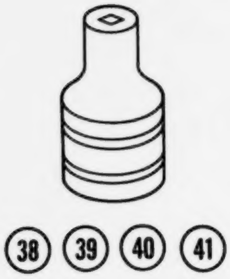


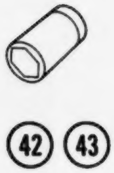
(1) ILLUS. NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	(4) U/M	(5) QTY RQR
26	4930-00-253-2478	LUBRICATING GUN, HAND, LEVER OPERATED, HIGH PRESSURE 14 OZ. (INSIDE REAR BUMPER) (36251) 1142	EA	1
27	LO9-1450-646-12	LUBRICATION ORDER, MLRS CARRIER (PAMPHLET BAG) (19207) LO9-1450-646-12	EA	1
28	4930-00-262-8868	OILER, HAND, TRIGGER TYPE, 9 IN. SPOUT, 1 PT. CAPACITY (ENGINE COMPARTMENT ACCESS DOOR) (72793) 328	EA	1
29	5340-00-682-1645	PADLOCK, KEY OPERATED WITH TWO KEYS (CARRIER EXTERIOR) (96906) MS 35647-6	EA	8
30	8345-00-174-6865	PANEL MARKER, FS-17/GVX (REAR SHELF INSIDE CAB) (81349) MIL-P-40061	EA	1
31	5120-00-223-7397	PLIERS, COMBINATION, SLIP JOINT, W/CUTTER 8 IN. LONG (TOOL BAG) (19207) 5214421	EA	1

BASIC ISSUE ITEMS (cont)



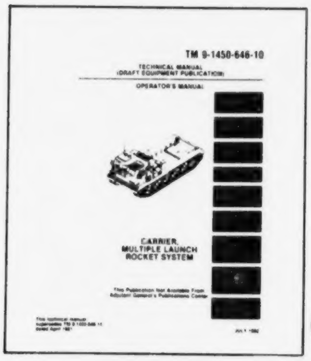
(1) ILLUS. NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	(4) U/M	(5) QTY RQR
32	5120-00-234-5223	RULE, STEEL MACHINIST, 6 IN. LONG (TOOL BAG) (73792) 676	EA	1
33	5120-00-278-1283	SCREWDRIVER, FLAT-TIP, 5/16 IN. SQ DRIVE, 6 INCH BLADE (TOOL BAG) (19207) 4151104	EA	1
34	5120-00-764-8061	SCREWDRIVER, FLAT-TIP, 3/8 IN. SQ DRIVE, 12 IN. LONG (TOOL BAG) (81348) GGG-S-121	EA	1
35	5120-00-224-7375	SCREWDRIVER, CROSS-TIP, NO. 4 (TOOL BAG) (21340) 125571	EA	1
36	4030-01-187-0964	SHACKLE (ATTACHED TO FRONT AND REAR TOWING EYES) (19207) (12328579)	EA	4
37	5120-00-293-3336	SHOVEL, ROUND POINT, D-HANDLE (ON ENGINE ACCESS DOOR) (19207) 11655784	EA	1

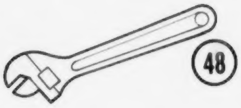


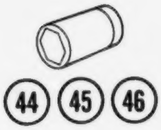


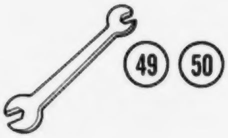
(1) ILLUS. NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	(4) U/M	(5) QTY RQR
38	5120-00-237-0982	SOCKET, SOCKET WRENCH, 1/2 IN. SQ DR, 3/8 IN. 12 PT OPENING (TOOL BAG) (55719) SW120	EA	1
39	5120-00-189-7924	SOCKET, SOCKET WRENCH, 1/2 IN. SQ DR, 7/16 IN. 12 PT OPENING (TOOL BAG) (95683) 41W3005	EA	1
40	5120-00-237-0984	SOCKET, SOCKET WRENCH, 1/2 IN. SQ DR, 1/2 IN. 12 PT OPENING (TOOL BAG) (95683) 41W3007	EA	1
41	5120-00-189-7932	SOCKET, SOCKET WRENCH, 1/2 IN. SQ DR, 9/16 IN. 12 PT OPENING (TOOL BAG) (19207) 11677025-1	EA	1
42	5120-00-189-7946	SOCKET, SOCKET WRENCH, 1/2 IN. SQ DR, 5/8 IN 12 PT OPENING (TOOL BAG) (19207) 11677025-2	EA	1
43	5120-00-189-7985	SOCKET, SOCKET WRENCH, 1/2 IN. SQ DR, 3/4 IN. 2 PT OPENING (TOOL BAG) (19207) 11677025-4	EA	1

BASIC ISSUE ITEMS (cont)

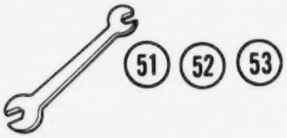

TM 9-1450-646-10
TECHNICAL MANUAL
(DRAFT EQUIPMENT PUBLICATION)
OPERATOR'S MANUAL
CARRIER,
MULTIPLE LAUNCH
ROCKET SYSTEM

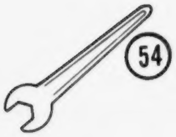






(1) ILLUS. NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	(4) U/M	(5) QTY RQR
44	5120-00-189-7934	SOCKET, SOCKET WRENCH, 1/2 IN. SQ DR, 7/8 IN. 2 PT OPENING (TOOL BAG) (19207) 11677025-5	EA	1
45	5120-00-189-7914	SOCKET, SOCKET WRENCH, 1/2 IN. SQ DR, 1 1/8 IN. 12 PT OPENING (TOOL BAG)	EA	1
46	5120-00-181-6813	SOCKET, SOCKET WRENCH, 3/4 IN. SQ DR, 15/16 IN. 12 PT OPENING (TOOL BAG) (47805) 5530	EA	1
47	TM 9-1450-646-10	TECHNICAL MANUAL, OPERATOR'S (PAMPHLET BAG) (19207) TM 9-1450-646-10	EA	1
48	5120-00-264-3796	WRENCH, ADJUSTABLE, 1 5/16 IN. MAX OPENING, 12 IN. LONG (TOOL BAG) (19207) 11655778-5	EA	1
49	5120-00-277-2307	WRENCH, OPEN END, 5/16 IN., AND 3/8 IN. 3 5/8 IN. LONG (TOOL BAG) (55719) S1012	EA	1
50	5120-00-187-7123	WRENCH, OPEN END, 7/16 IN. AND 1/2 IN., 4 1/2 IN. LONG (TOOL BAG) (14674) E1416	EA	1





(1) ILLUS. NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	(4) U/M	(5) QTY RQR
51	5120-00-293-2134	WRENCH, OPEN END, 9/16 IN., AND 11/16 IN. 6 IN. LONG (TOOL BAG) (19207) 5323330	EA	1
52	5120-00-224-3102	WRENCH, OPEN END, 5/8 IN. AND 3/4 IN., 7 IN. LONG (TOOL BAG) (65814) 729	EA	1
53	5120-00-187-7130	WRENCH, OPEN END, 13/16 IN. AND 7/8 IN., 8 1/2 IN. LONG (TOOL BAG) (07971) E2628	EA	1
54	5120-00-293-1324	WRENCH, OPEN END, 1 3/8 IN. 11 1/2 IN. LONG (TOOL BAG) (07971) 1708A	EA	1

APPENDIX C
ADDITIONAL AUTHORIZATION LIST

Section I. INTRODUCTION

SCOPE

This appendix lists additional items you are authorized for the support of the MLRS carrier.

GENERAL

This list identifies items that do not have to accompany the MLRS carrier, and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOE, TDA, or JTA.

EXPLANATION OF LISTING

National stock numbers, descriptions, and quantities are provided to help you identify and request the additional items you require to support this equipment. The items are listed in alphabetical sequence by item name under the type document (i.e., CTA, MTOE, TDA, or JTA) which authorizes the item(s) to you.

Section II. ADDITIONAL AUTHORIZATION LIST

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION FSCM and Part Number	(3) U/M	(4) QTY AUTH
6665-00-935-6955	ALARM, CHEMICAL AGENT, M-8 VG W/ACCESSORIES (81361) D5-15-4444	EA	1
6665-00-859-8738	1 EA ALARM UNIT, CHEMICAL M42E1 (81361) D5-15-4400		
6665-00-859-2215	4 EA BATTERY, DRY CELL (80058) BA3030U		
6130-00-930-0030	1 EA BATTERY, DRY CELL (81361) D5-15-4826		
6665-00-859-2201	1 EA DETECTOR KIT, CHEMICAL M43 (81361) D5-15-4400		
6665-00-859-2214	1 EA REFILL KIT, CHEMICAL AGENT, AUTOMATIC ALARM, M229 (81361) D5-15-4700		
1240-00-530-0974	BINOCULAR, 7x50, M17A1 W/CASE (19200) 670-2518	EA	1
6650-00-769-4281	1 EA CASE, CARRYING M63A1 (19200) 769-4281		
1305-00-926-3930	CARTRIDGE, 5.56MM, M193 BALL W/CLIPS, WITH MAGAZINE FILLERS AND BANDOLIERS (19200) 10523632	EA	840
4240-00-720-1618	DECONTAMINATING APPARATUS, PORTABLE DS2, 1 1/2 QT. ABC-M11 (81361) D5-51-269	EA	1
6665-01-016-8399	DETECTOR KIT, CHEMICAL AGENT, M256 (81361) C5-77-2001	EA	1
	EARPLUGS, V51R, AVAILABLE IN THE FOLLOWING SIZES:	EA	3
6515-00-422-9821	EARPLUGS, V51R, SMALL (76260) 42-15355-4		
6515-00-422-4818	EARPLUGS, V51R, MEDIUM (76260) 42-15355-4		
6515-00-467-0092	EARPLUGS, V51R, LARGE (76260) 42-15355-4		
8430-01-021-5978	FOOTWEAR COVERS, CHEMICAL PROTECTION (94744) 419	EA	3

ADDITIONAL AUTHORIZATION LIST (cont)

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION FSCM and Part Number	(3) U/M	(4) QTY AUTH
8415-01-033-5417	GLOVE SET, CHEMICAL PROTECTION (19206) 11579233	EA	3
1330-00-724-8081	GRENADE, 40MM (FOR LAUNCHER, GRENADE, M203) (19203) 8835950	EA	10
	HELMET, COMBAT VEHICLE CREWMAN'S, DH-132, AVAILABLE IN THE FOLLOWING SIZES:	EA	3
8415-00-094-2684	HELMET, COMBAT VEHICLE CREWMAN'S, DH-132, LARGE (81337) LP/P DES 23-72		
8415-00-094-2691	HELMET, COMBAT VEHICLE CREWMAN'S, DH-132, MEDIUM (81337) LP/P DES 23-72		
8415-00-094-2679	HELMET, COMBAT VEHICLE CREWMAN'S, DH-132, SMALL (81337) LP/P DES 23-72		
4240-00-860-8987	HOOD, MASK PROTECTIVE FIELD, M-5 (81349) MIL-H-51143	EA	3
1010-00-179-6447	LAUNCHER, GRENADE, 40MM, M203 (19204) 11838703	EA	1
	MASK, CBR PROTECTIVE TANK, AVAILABLE IN THE FOLLOWING SIZES:	EA	3
4240-00-994-8751	MASK, CBR PROTECTIVE TANK, SMALL (81349) MIL-M-51178		
4240-00-994-8750	MASK, CBR PROTECTIVE TANK, MEDIUM (81349) MIL-M-51178		
4240-00-994-8752	MASK, CBR PROTECTIVE TANK, LARGE (81349) MIL-M-51178		
5855-00-150-1820	NIGHT VISION GOGGLES, AN/PVS-5 (80058) AN/PVS-5	EA	2
6665-00-069-8906	RADIAC SET, AN/VDR-1 (80058) AN/VDR-1	EA	1
5820-00-223-7434	RADIO SET, AN/VRC-47 (80058) AN/VRC-47	EA	1
8970-00-577-4513	RATIONS, FIELD (CASE) (81349) MIL-M35048	EA	1
1005-00-073-9421	RIFLE, 5.56MM, M16A1 (19204) 8448500	EA	3

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION FSCM and Part Number	(3) U/M	(4) QTY AUTH
5810-00-434-3644	SECURITY EQUIPMENT SET, TSEC/KY57 (98230) ON241700	EA	2
7310-00-285-6155	STOVE, COOKING, GASOLINE M1950, 1 BURNER W/CASE (81349) MIL-S-10736	EA	1
	SUIT, CHEMICAL PROTECTIVE, AVAILABLE IN THE FOLLOWING SIZES:	EA	3
8415-00-177-5007	SUIT, CHEMICAL PROTECTIVE, SMALL (81349) MIL-S-43926		
8415-00-177-5008	SUIT, CHEMICAL PROTECTIVE, MEDIUM (81349) MIL-S-43926		
8415-00-407-1062	SUIT, CHEMICAL PROTECTIVE, LARGE (81349) MIL-S-43926		
8415-00-407-1063	SUIT, CHEMICAL PROTECTIVE, EXTRA LARGE (81349) MIL-S-43926		
8415-00-407-1064	SUIT, CHEMICAL PROTECTIVE, EXTRA EXTRA LARGE (81349) MIL-S-43926		

APPENDIX D
EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

SCOPE

This appendix lists expendable supplies and materials you will need to operate and maintain the MLRS carrier. These items are authorized to you by CTA 59-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

EXPLANATION OF COLUMNS

a. *Column 1-Item Number.* This number is assigned to the entry in the listing, and is referenced in the narrative instructions to identify the material (e.g., Dry cleaning solvent Item 5, App D).

b. *Column 2-Level.* This column identifies the lowest level of maintenance that requires the listed item.

C — Operator/Crew

c. *Column 3-National Stock Number.* This is the National Stock Number assigned to the item; use it to request or requisition the item.

d. *Column 4-Description.* Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates Federal Supply Code for Manufacturer (FSCM) in parentheses, followed by the part number.

e. *Column 5-Unit of Measure (UIM).* Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Section II. EXPENDABLE SUPPLIES AND MATERIALS

EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION FSCM & PART NUMBER	(5) U/M
1	C	6850-00-181-7929	ANTIFREEZE (81349) MIL-A-46153	GL
2	C	9150-00-190-0904	AUTOMOTIVE GREASE (GAA) (1 LB CAN) (81349) MIL-G-10924	EA
3	C	6135-00-835-7211	BATTERY SPEC W-B-101	EA
4	C	7920-00-044-9821	CLOTH, LINT FREE (51200) MIRACLE WIPE L001	LB
5	C	6850-00-264-9037	DRY CLEANING SOLVENT (81348) PD-680	QT
6	C	9150-00-754-2595	GREASE, MOLYBDENUM DISULFIDE (81349) MIL-G-21164	LB
7	C	9150-00-935-9807	HYDRAULIC FLUID (96906) MIL-H-6083	GL
8	C	9150-00-186-6681	LUBRICATION OIL, GRADE 30 (15958) ALLIED C030	QT
9	C	9150-00-402-2372	LUBRICATION OIL, OEA (81348) MIL-L-46167	GL
10	C	7930-00-252-0779	SCRUBBING SOAP (58536) AA44	GL
11	C	7920-00-205-1711	WIPING RAG (58536) A-A-531	LB

APPENDIX E
STOWAGE AND SIGN GUIDE

Section I. INTRODUCTION

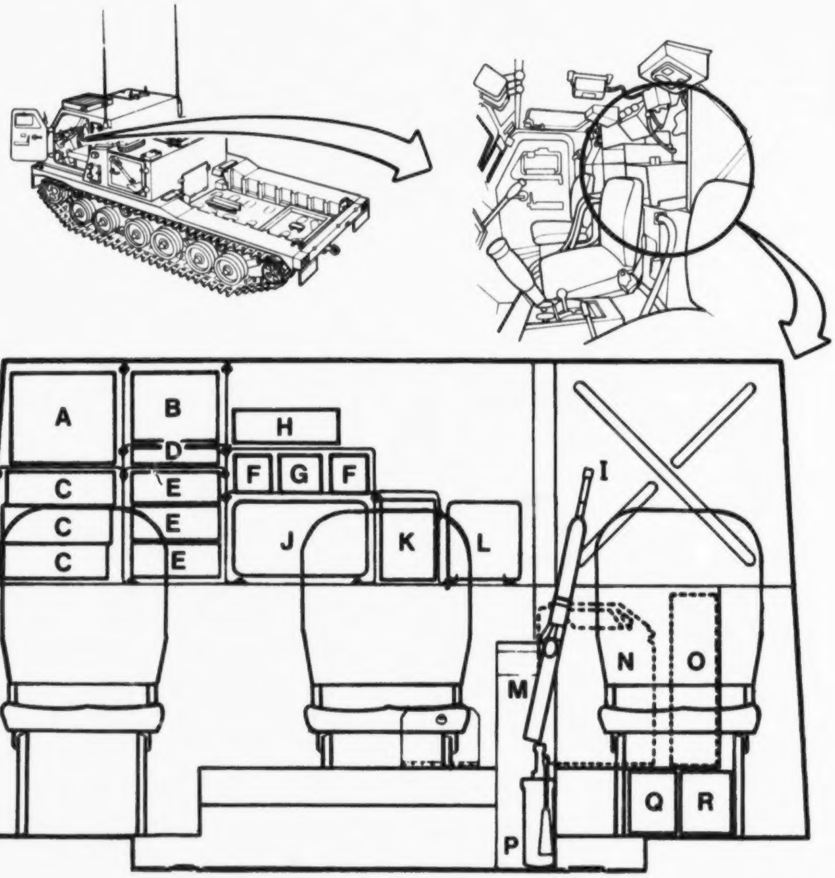
SCOPE

This appendix shows locations for stowage of equipment and material carried on the MLRS (Multiple Launch Rocket System) carrier.

GENERAL

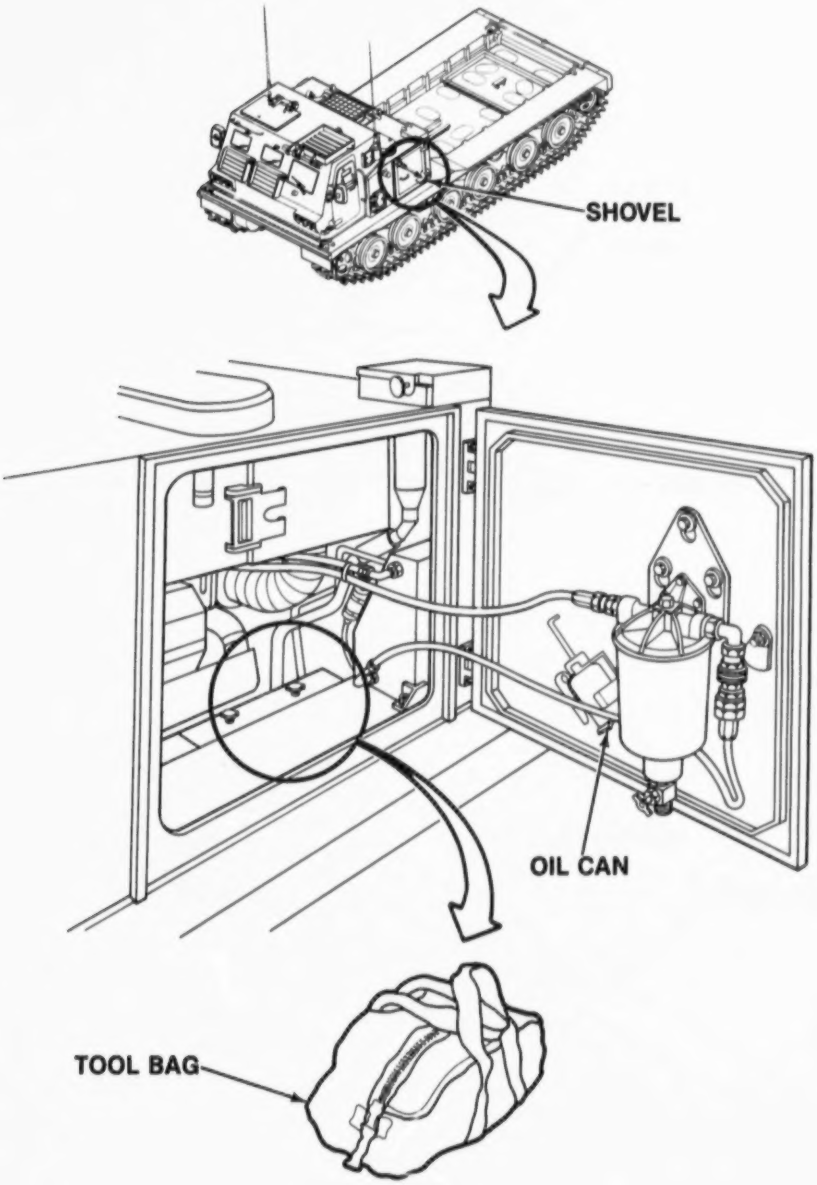
The figures on the next pages show location of decals, stencils, and metal signs used on the carrier. Most of these signs mark places where equipment should be stowed. Some of them are "Caution" signs which provide information needed to operate the carrier safely.

Section II. CAB INTERIOR

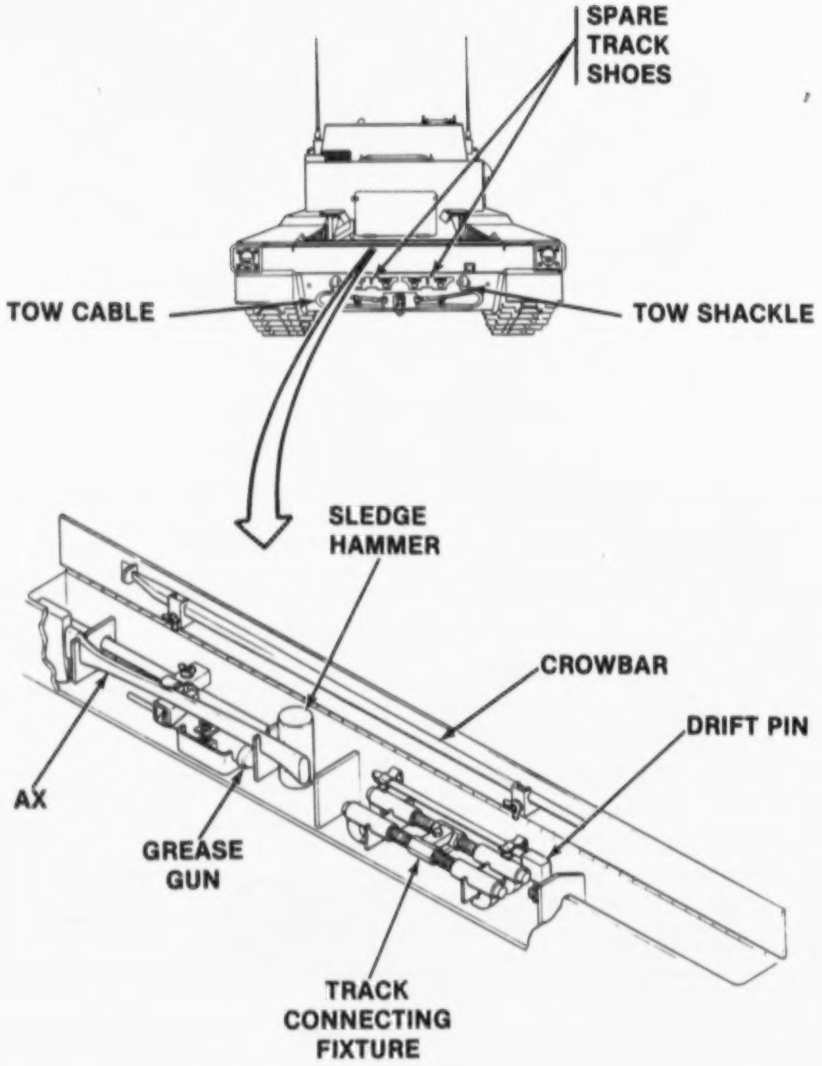


A Alarm system M8
B Goggles AN/PVS-5
C Chemical protective suits (3)
D Gloves, hoods, and
 footwear set (3)
E NBC tank masks (3)
F Security equip. TSEC/KY57
G Communications Mode Selector
 CMSC C-10377/GCT
H Communication Processor 13032450
I Rifle M16A1, 5.56mm
J Radio RT-524A/VRC
K Receiver R-442/VRC
L Auto alarm detector M43
M Flashlight
N Water can (2)
O Field rations
P Fire extinguisher
Q Cartridges, 5.56mm, box
R Grenades, 40mm, box

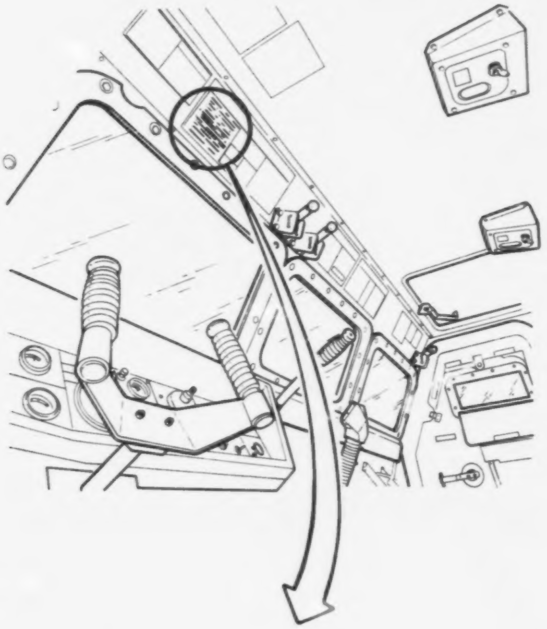
Section III. SIDE ENGINE ACCESS DOOR


SHOVEL
OIL CAN
TOOL BAG

Section IV. REAR OF CARRIER


SPARE
TRACK
SHOES
TOW CABLE
TOW SHACKLE
SLEDGE
HAMMER
CROWBAR
DRIFT PIN
AX
GREASE
GUN
TRACK
CONNECTING
FIXTURE

REAR OF CARRIER (cont)



VEHICLE OPERATION GENERAL INSTRUCTIONS

NORMAL STARTING

1. PLACE GEAR SELECTOR IN NEUTRAL
2. ENGAGE HAND BRAKE
3. TURN MASTER POWER TO ENGINE ON
4. PUSH FUEL HANDLE TO ON POSITION
5. SOUND THE HORN
6. PUSH RANGE SELECTOR TO START POSITION UNTIL ENGINE STARTS (15 SECONDS MAXIMUM) WAIT 30 SECONDS BETWEEN STARTING ATTEMPTS
7. RELEASE HAND BRAKE BEFORE PLACING RANGE SELECTOR IN GEAR

STARTING WITH LAUNCHER BATTERIES

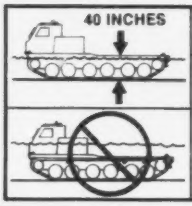
1. TURN ON LAUNCHER INTERCONNECT SWITCH
2. FOLLOW STEPS 1. THROUGH 7. ABOVE

STARTING WITH DEAD BATTERIES

1. CONNECT SLAVE CABLE. ASSURE CORRECT POLARITY
2. FOLLOW STEPS 1. THROUGH 6. ABOVE
3. REMOVE SLAVE CABLE

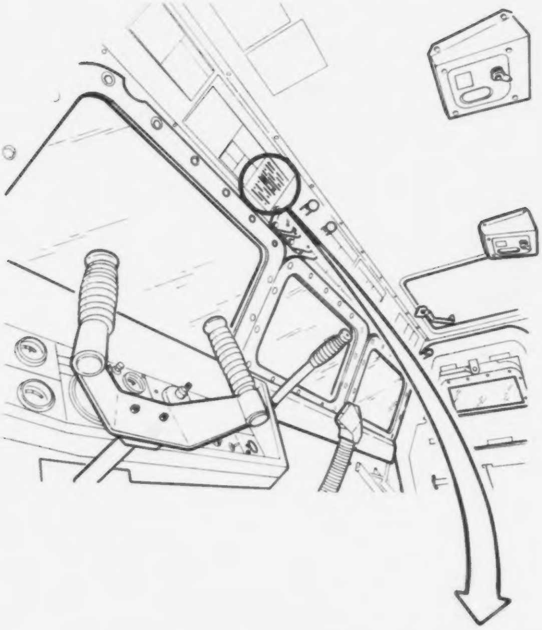
WATER FORDING

1. VISUALLY CHECK THE DRAIN PLUGS
2. DRIVE CAREFULLY AND SLOWLY WHILE FORDING. THERE MAY BE HIDDEN CHANNELS OR BOULDERS



⚠ WARNING

DO NOT FORD DEPTHS MORE THAN FORTY (40) INCHES. SEE OPERATOR'S MANUAL



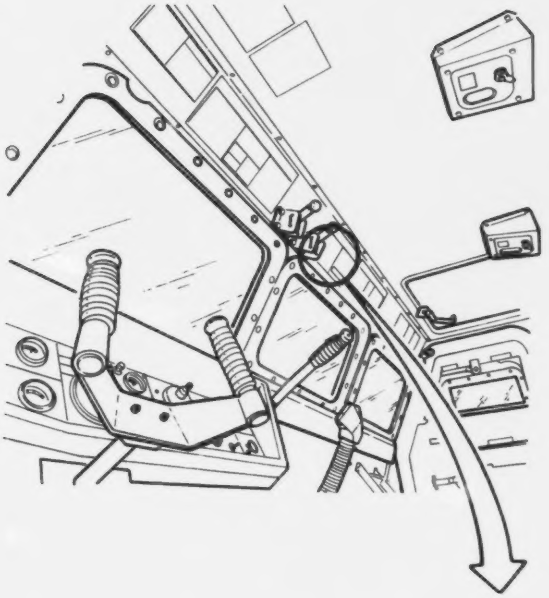
TOWED START

1. RELEASE HAND BRAKE
2. PLACE RANGE SELECTOR IN TOW
3. TURN MASTER POWER TO ENGINE ON
4. PUSH FUEL HANDLE TO ON POSITION
5. TOW VEHICLE AT 10-15 MPH (16-24 KM/H)
6. PLACE RANGE SELECTOR IN TOW START POSITION
7. WHEN ENGINE STARTS, PLACE RANGE SELECTOR IN DRIVE AND SLOWLY BRING BOTH VEHICLES TO A STOP
8. IF ENGINE DOES NOT START IN TEN (10) SECONDS, STOP AND CHECK FOR MALFUNCTION
9. DISCONNECT TOW BAR AND RETURN TO NORMAL OPERATION

VEHICLE SHUT DOWN

1. PLACE GEAR SELECTOR IN NEUTRAL
2. ENGAGE HAND BRAKE
3. PUSH FUEL SHUT OFF HANDLE TO OFF
4. TURN OFF MASTER POWER AND LAUNCHER INTERCONNECT SWITCHES

REAR OF CARRIER (cont)



ENGINE COMPARTMENT MAINTENANCE

VEHICLE MUST BE APPROXIMATELY LEVEL

ENGINE

1. ENGINE OFF. CHECK OIL LEVEL ON DIPSTICK. LOCATION: THROUGH LARGE ACCESS DOOR ON LEFT SIDE OF VEHICLE

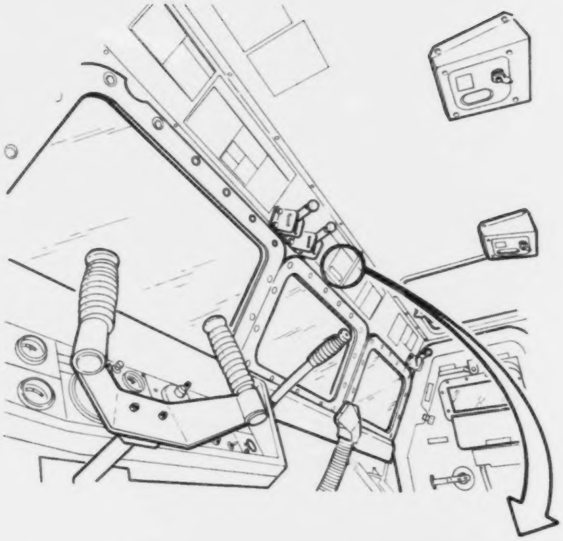
FINAL DRIVE

1. ENGINE OFF. CHECK OIL LEVEL ON TWO (2) DIPSTICKS. LOCATION: THROUGH COVER PLATES IN CAB FLOOR

TRANSMISSION

1. ENGINE OFF. CHECK DIPSTICK FOR AN INDICATION OF OIL. LOCATION: THROUGH ACCESS PANEL BEHIND CENTER SEAT
2. HAND BRAKE ON AND GEAR SELECTOR IN NEUTRAL. RUN ENGINE AT IDLE FOR TWO (2) MINUTES
3. MAINTAIN GEAR SELECTOR IN NEUTRAL. CHECK OIL LEVEL WITH ENGINE IDLING
4. CHECK OIL FILTER CONDITION INDICATOR THROUGH LARGE PLUG HOLE UNDER CENTER SEAT

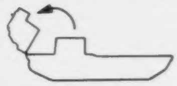
ALL OTHER MAINTENANCE TO BE
PERFORMED AS INSTRUCTED
IN THE MAINTENANCE MANUAL



CAB TILT PROCEDURE

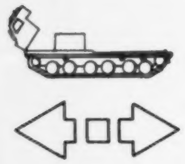
VEHICLE MUST BE APPROXIMATELY LEVEL

TO RAISE CAB



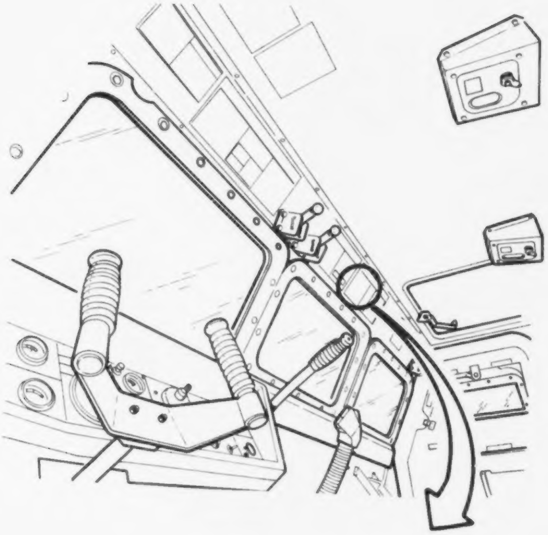
1. GEAR SELECTOR IN NEUTRAL. HAND BRAKE ENGAGED
2. FUEL SHUTOFF HANDLE IN OFF POSITION
3. MASTER POWER OFF. LAUNCHER INTERCONNECT OFF
4. CHECK STOWAGE. SECURE OR REMOVE ALL LOOSE ITEMS FROM CAB
5. RELEASE CAB HOLD DOWN FASTENERS. LOCATION: RIGHT REAR AND LEFT REAR CAB FLOOR. REMOVE KNURLED KNOBS FROM PINS. USE 1/2-IN. SQUARE DRIVE WRENCH
6. SECURE CAB SIDE DOORS
7. REMOVE CAB ACTUATOR COVER FOR ACCESS TO JACKSCREW. LOCATION: FRONT HULL PLATE
8. ROTATE JACKSCREW COUNTERCLOCKWISE TO RAISE CAB. USE EXTENSION BAR AND RATCHET HANDLE. A LIMIT STOP IS PROVIDED AT FULL OPEN POSITION

⚠ CAUTION



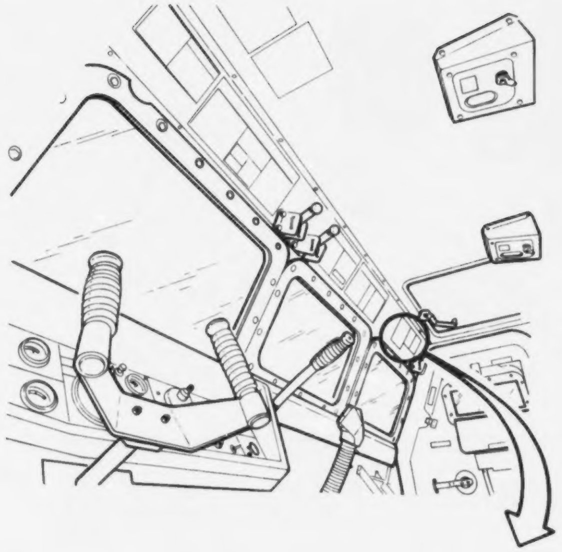
Do not release hand brake with engine running when cab is raised. This can result in abrupt vehicle movement.

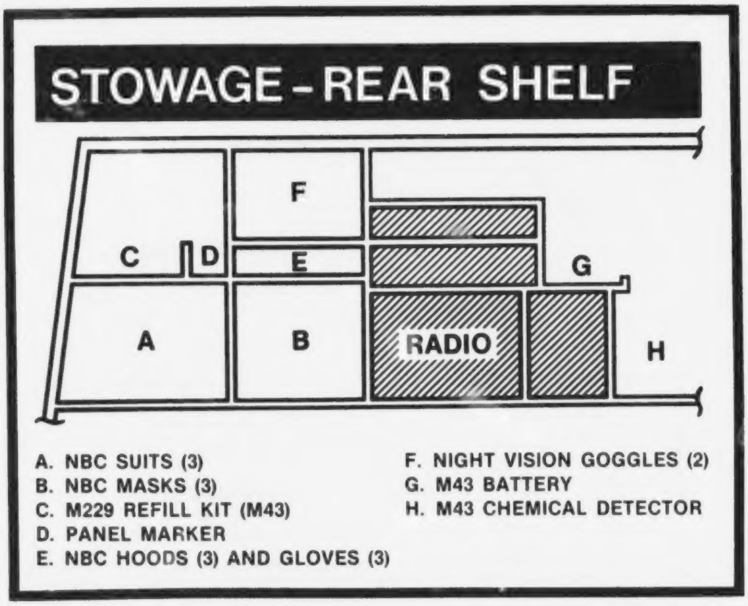
REAR OF CARRIER (cont)



TO LOWER CAB

1. GEAR SELECTOR IN NEUTRAL. HAND BRAKE ENGAGED
2. FUEL SHUTOFF HANDLE IN OFF POSITION
3. MASTER POWER OFF. LAUNCHER INTERCONNECT OFF
4. CHECK ENGINE COMPARTMENT AREA UNDER CAB. REMOVE ALL FOREIGN OBJECTS AND TOOLS
5. ROTATE JACKSCREW CLOCKWISE TO LOWER CAB. LOCATION: FRONT HULL PLATE. USE HEX SOCKET, EXTENSION BAR AND RATCHET HANDLE. STOP WHEN PINS FULLY ENGAGE CAB HOLD DOWN FASTENERS
6. REPLACE KNURLED KNOBS ON PINS AND TIGHTEN. USE 1/2-IN. SQUARE DRIVE WRENCH
7. ROTATE JACKSCREW TO FREE POSITION (NO LOAD IN EITHER DIRECTION). REPLACE CAB ACTUATOR COVER ON FRONT HULL PLATE




STOWAGE - REAR SHELF

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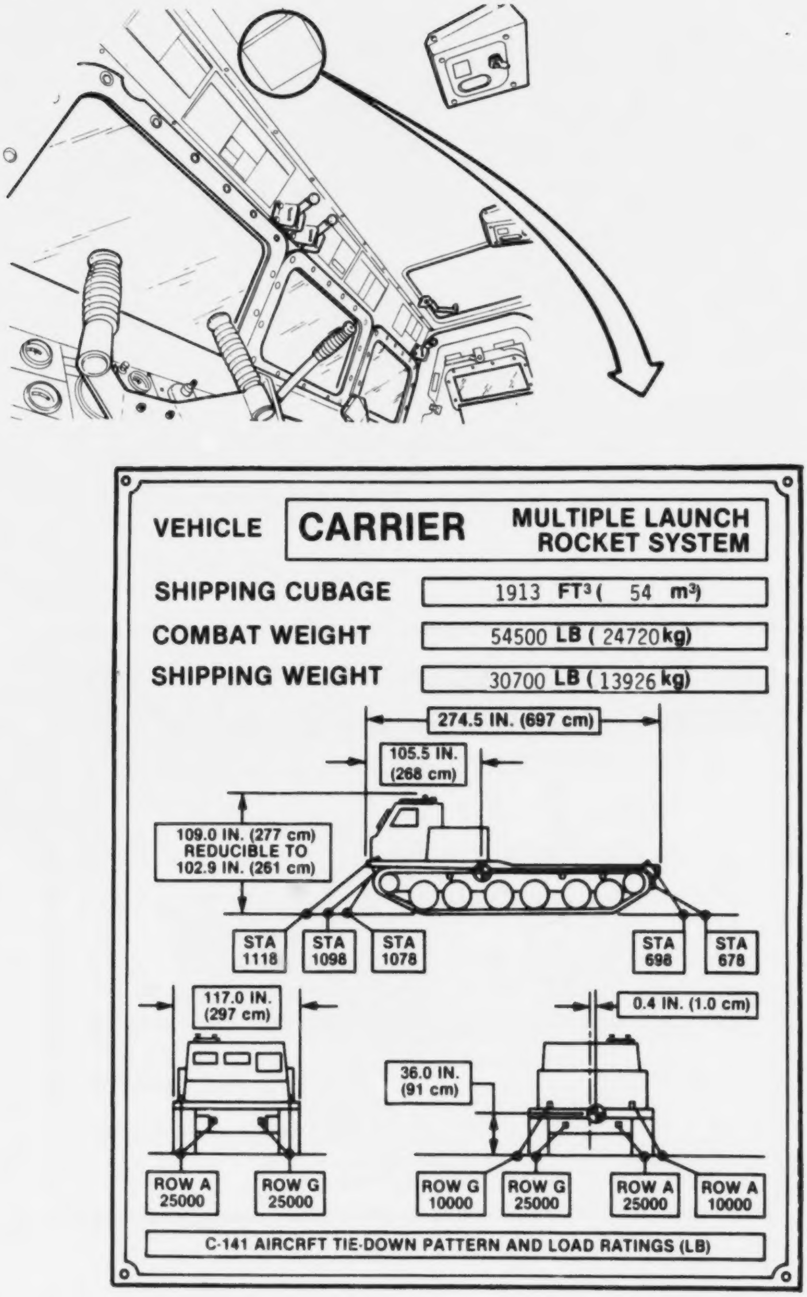
B. NBC MASKS (3)
C. M229 REFILL KIT (M43)
D. PANEL MARKER
E. NBC HOODS (3) AND GLOVES (3)
F. NIGHT VISION GOGGLES (2)
G. M43 BATTERY
H. M43 CHEMICAL DETECTOR

REAR OF CARRIER (cont)



VEHICLE **CARRIER** MULTIPLE LAUNCH ROCKET SYSTEM

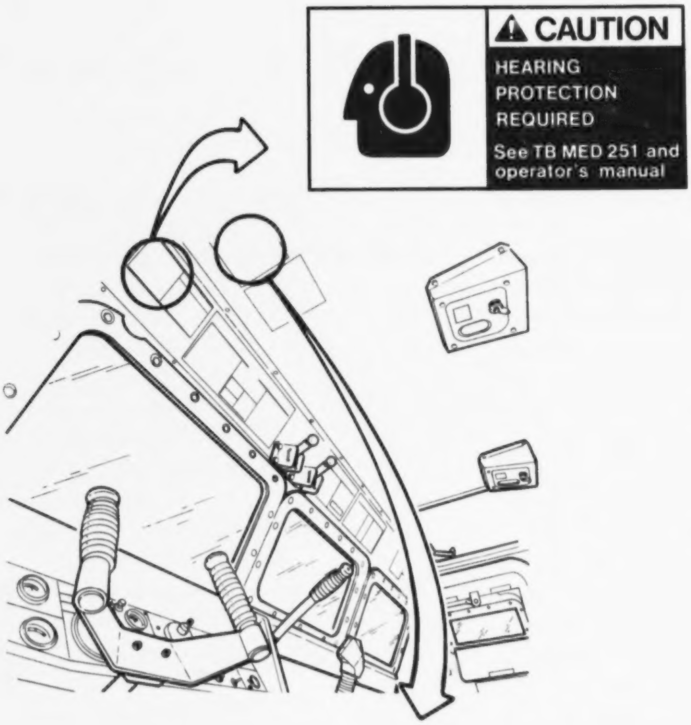
SHIPPING CUBAGE 1913 FT³ (54 m³)

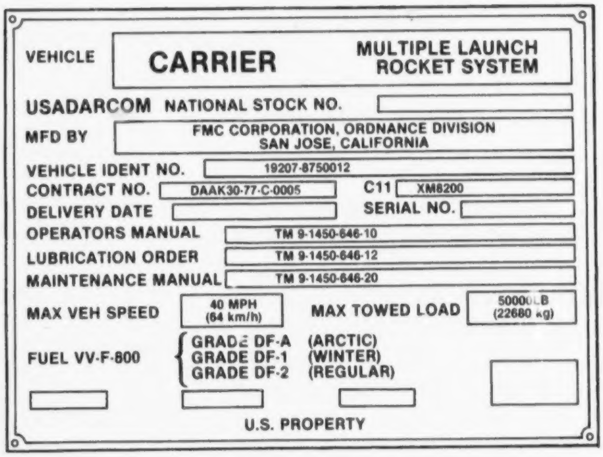
COMBAT WEIGHT 54500 LB (24720 kg)

SHIPPING WEIGHT 30700 LB (13926 kg)

274.5 IN. (697 cm)
105.5 IN. (268 cm)
109.0 IN. (277 cm) REDUCIBLE TO 102.9 IN. (261 cm)
STA 1118
STA 1098
STA 1078
STA 698
STA 678
117.0 IN. (297 cm)
0.4 IN. (1.0 cm)
36.0 IN. (91 cm)
ROW A 25000
ROW G 25000
ROW G 10000
ROW G 25000
ROW A 25000
ROW A 10000

C-141 AIRCRFT TIE-DOWN PATTERN AND LOAD RATINGS (LB)


CAUTION
HEARING
PROTECTION
REQUIRED
See TB MED 251 and
operator's manual



VEHICLE	CARRIER	MULTIPLE LAUNCH ROCKET SYSTEM	
USADARCOM	NATIONAL STOCK NO.		
MFD BY	FMC CORPORATION, ORDNANCE DIVISION SAN JOSE, CALIFORNIA		
VEHICLE IDENT NO.	19207-8750012		
CONTRACT NO.	DAAK30-77-C-0005	C11	XM8200
DELIVERY DATE		SERIAL NO.	
OPERATORS MANUAL	TM 9-1450-646-10		
LUBRICATION ORDER	TM 9-1450-646-12		
MAINTENANCE MANUAL	TM 9-1450-646-20		
MAX VEH SPEED	40 MPH (64 km/h)	MAX TOWED LOAD	50000 LB (22680 kg)
FUEL VV-F-800	GRADE DF-A (ARCTIC) GRADE DF-1 (WINTER) GRADE DF-2 (REGULAR)		

U.S. PROPERTY

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6	2-1 a			In line 6 of paragraph 2-1a the manual states the engine has 6 cylinders. The engine on my set only has 4 cylinders. Change the manual to show 4 cylinders.
81	4-3			Callout 16 on figure 4-3 is pointing at a bolt. In the key to fig. 4-3, item 16 is called a shim. Please correct one or the other.
125	line 20			I ordered a gasket, item 19 on figure B-16 by NSN 2910-00-762-3001. I got a gasket but it doesn't fit. Supply says I got what I ordered so the NSN is wrong. Please give me a good NSN.

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THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
1 Kilometer = 1000 Meters = 0.621 Miles

WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
1 Kilogram = 1000 Grams = 2.2 Lb
1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

SQUARE MEASURE

1 Sq Centimeter = 100 Sq Millimeters = 0.155 Sq Inches
1 Sq Meter = 10,000 Sq Centimeters = 10.76 Sq Feet
1 Sq Kilometer = 1,000,000 Sq Meters = 0.386 Sq Miles

CUBIC MEASURE

1 Cu Centimeter = 1000 Cu Millimeters = 0.06 Cu Inches
1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

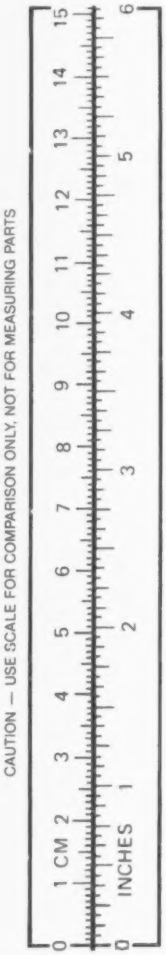
TEMPERATURE

$\frac{5}{9}(^\circ F - 32) = ^\circ C$
212° Fahrenheit is equivalent to 100° Celsius
90° Fahrenheit is equivalent to 32.2° Celsius
32° Fahrenheit is equivalent to 0° Celsius
$\frac{9}{5}\,^\circ C + 32 = ^\circ F$

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Millimeters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Inch-pounds	Centimeter-kilograms	1.152
Foot-pounds	Meter-kilograms	0.138
Pounds per Square Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Centimeter-kilograms	Inch-pounds	0.868
Meter-kilograms	Foot-pounds	7.233
Kilopascals	Pounds per Square Inch	0.145
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour	Miles per Hour	0.621


CAUTION — USE SCALE FOR COMPARISON ONLY, NOT FOR MEASURING PARTS
1 CM
INCHES
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